

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.



GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED
TO BEES
AND MONEY
AND HOME
INTERESTS.

ILLUSTRATED
SEMI-MONTHLY

Published by THE A. ROOT CO.
\$1.00 PER YEAR MEDINA, OHIO.

VOL. XXIX.

MAY 1, 1901.

No. 9.



IS THERE NO LAW against cock-fighting in Ohio to prevent A. I. Root from carrying on in the way described on p. 357?

I WONDER what makes the difference between Mrs. Barber's experience, p. 338, and mine. Her bait sections are left unsealed. Mine are sealed *first*, and in a season of failure a bait section will be filled and sealed, and not a drop of honey in another section.

L. STACHELHAUSEN's brushed swarms have this in their favor, that they were championed by one of the ablest bee-keepers of the 19th century, the late C. H. J. Gravenhorst. [Yes, and then the advantage of such "swarming" is that it is all done at our convenience.—ED.]

THEODOR WEIPPL, in *Deutsche Imker aus Boehmen*, speaking of the theory that bees inherit their qualities from the nurse-bees rather than the queen, says it appeared among others in GLEANINGS. Friend Weippl, I think it was not advocated in GLEANINGS, only mentioned as a foreign product that has not yet taken root in American soil.

I DON'T KNOW whether I made the blunder, p. 330, of saying that my top-bars, end-bars, and bottom-bars are $1\frac{1}{8}$ wide, or whether the printer was fooling with my copy; but at any rate it should be $1\frac{1}{8}$. Possibly $1\frac{1}{8}$ might be better, for there's more building between the bars than I like. [By referring to your copy, doctor, we find the mistake was yours.—ED.]

F. GREINER, p. 323, thinks that, when I said apiaries of at most 120 colonies were placed "at least $\frac{1}{2}$ mile" apart on the Lueneburg heath, the German $\frac{1}{2}$ mile was meant. I have not at hand the *Centralblatt* quoted from, so I can't be sure about it, but nowadays the metric measure is generally used in German journals; and if my memory is not at fault the distance was a kilometer, or about $\frac{3}{8}$ of a mile, and to put it in round numbers I said at least $\frac{1}{2}$ mile. Still, friend Greiner may be right, and the question is open.

HOW PRONE we are to have our eyes open wider to see what suits us than what doesn't! The editor, p. 326, calls Arthur C. Miller's theorizing my "conclusion," leaving entirely out of view the *fact* I gave on the other side. The theory looks pretty weighty, but I confess that the fact that, with four painted hives, in a lot of more than 200, the hive that stood conspicuous above all others for moisture was one of the painted ones, looks about as weighty as the theory referred to. [I should be inclined to believe that the one that was conspicuous for moisture was not conspicuous because of the paint, but because of some condition in or about the hive. But there is one point in regard to paint that has not yet been touched on, and that is this: The paint prevents the hive-body from warping and twisting; and aside from the one point of durability this is very important in moving bees to outyards. Unpainted hives are liable to gap at the corners, to say nothing of the fact that the covers do not rest down squarely.—ED.]

YOU MAY be right, Mr. Editor, that steam is better for a wax-press than water, but it must be remembered that Gerstung, who prefers water-presses, was familiar with different steam-presses by actual use, while you, perhaps, have tried neither. Of course, though, Gerstung might be expected to be partial to his own baby. Say—you try both, and then we'll trust your word as to which is best. [Mr. W. W. Cary, then of Colerain, Mass., advocated the use of a press in a vat of hot water, something like 23 years ago. This method was published in our A B C book in some eight or ten editions; but so far as I know no one who ever tried it liked it very well. When the press is put into hot water the wax must flow off on the surface of the water and with it. When the press is put into a box or can of hot steam, the wax, by gravity, runs down to the lowest portion of the enclosure, free from the hot water, and free from dirt. While just as much wax can be obtained by one method as by the other, yet steam gives us the advantage of convenience.—ED.]

ARE YOU NOT a little modest, Mr. Editor, in demanding only 40,000 to 50,000 bees, p. 331, for a "large force"? L. Stachelhausen says, p. 333, "I have, in large hives, many

times observed that the queen had laid, during the previous 21 days, 3400 eggs daily, on an average." Three weeks later about all the bees from that 21 days' laying ought to be on hand, making 71,400. If we count the life of a worker 6 weeks, then there ought also to be present bees from the eggs of the preceding 21 days. Say the queen during that time laid 2000 eggs daily, and allow that half that number had been lost by fatalities, we should have 21,000 to add to the 71,400, making 92,400 in all. Perhaps that is not often reached, but I suspect it's nearer the right mark than 40,000. [Some years ago, when we used to buy swarms, just as they clustered, from farmers, we bought them by weight. The swarm would be hived by the farmer into a box, and then brought up to Medina at night. The box of bees was put on the scales, and the weight recorded. The bees were then dumped on some frames of foundation, in a hive in the yard, and the box was then brought back to the scales and reweighed. Now for the results: We had some tremendous swarms brought to us that we sometimes had to hive in a double-story chamber. The heaviest of those swarms weighed from 8 to 8½ lbs. The average of them ran about 5 or 6. There are about 4500 bees to the pound, on an average; so you can see that my estimate of a "large force" of worker bees, of from 40,000 to 50,000, can not be far wrong. Now, those eight-pound swarms would fill two stories full of bees, and of course you know these would all be working bees, and that is what I was talking about. But, again, I think you are wrong, clear wrong, in assuming that a given number of eggs laid by the queen will give the same number of bees. There are hundreds and thousands of eggs that disappear, we know not where. Over and over again I have seen frames well filled with eggs in the working season, and yet when these same frames were put into a queenless colony there would be only about two-thirds of the number of cells occupied with sealed brood that were occupied with eggs in the frame in the first place. This spring we noticed that the queens in our home yard would keep on laying eggs, and yet there would be no sealed brood or larvæ to speak of. It was too cold for the bees to take care of much brood and so they reared only what they could cover. I should think we would be safe in saying that, out of 70,000 to 90,000 eggs laid by a queen, we could not expect over 40,000 or 50,000 bees. In rearing poultry we should consider that we were doing well if we got half of the eggs hatched into chickens.—ED.]

THICK VS. THIN TOP-BARS.—S. T. Pettit, p. 227, comes down pretty hard on deep top-bars, although he thinks he can't do with less than ¾. His strong point is that, by having ¼-inch more depth, the space of 1600 to 2000 cells is lost. The mistake is in counting that the same number of bees are occupied brooding those sticks as would be occupied in brooding ¼-inch depth of comb. The space between the top-bars is ¼-inch, and that between brood-combs about ½ inch, thus knocking out half his objection at a clip.

But even that half of the objection will not stand. When the weather is hot, as it generally is when supers are over the top-bars, there is no trouble about keeping up the heat; and at any time when it becomes cool the bees will shrink away from the space between the top-bars, and cluster on the combs above and below. Suppose you have a colony fully occupying two stories. Now put between those two stories another story filled with dummies an inch thick. Do you suppose it will take 50 per cent more bees to man the combs than it did before? I suspect 5 per cent would be plenty.

Even if the loss were all he supposes—1600 to 2000 cells, or ⅓ of the brood-chamber—I should still want the top-bar ¾ deep. At one time I used, entirely, wide frames holding 8 sections; and when I put on a super I put in the middle of it a brood-comb from below. The bees very promptly occupied that super, but it did not answer to leave the brood-comb there very long. If I left it long enough for the bees to begin sealing the sections, they would carry across some of the old comb, and the sections would be about as dark as the combs opposite. With ¾ top-bars, which I used exclusively for many years, the same thing would happen to a certain extent if no slat honey-board was used, especially if the sections were left on some time after being sealed.

So if the prevention of burr-combs by deep top-bars be all a delusion—which I do not believe—and if there is a loss of 1600 to 2000 cells to a colony—which I am very far from believing—I still want ¾ top-bars for the sake of having the sections so far from the brood-combs that the bees will not find it convenient to carry up a lot of black wax to spoil the snow-white sections. [It seems to me our friend Pettit assumes, or indirectly assumes, that those 1600 to 2000 cells are lost because of the brood that *might* have been reared in them; but it is very seldom that brood is reared any closer than within an inch of the top-bar, with ordinary L. frames. Well, then, if those 1600 to 2000 cells are lost for honey, where will the surplus of honey go? Why, it will have to go into the supers, if there is not room below, and in the supers is where we want it. There has been a very strong tendency toward shallower brood-nests. If the use of thick top-bars cuts down the inside depth of the L. frame, it is a move in the right direction. And, again, if these 1600 to 2000 cells to a colony are so valuable, why would not 5000 or 10,000 cells be more valuable? If we need more cells in the ordinary brood-nest, why not add to the depth of the brood-chamber? I believe that if we could by some process cut down the depth of all the L. frames in use throughout the country, we should be conferring a favor on the great class of beekeepers using such frames; and the use of thick top-bars, besides ridding of burr and brace combs, reduces the depth of the frame slightly. No one talks about making frames deeper unless he wishes to go clear over to the other extreme of making the frames so deep that eight or ten of such frames will accom-

moderate the largest force of bees that can be held together in one brood-nest. My notion of brood-nests is this: One shallow enough so that two of them will accommodate a large colony, or one deep enough so that one will accommodate one such colony. Taking this view of the matter, I do not see that friend Pettit gains any thing by decrying the loss of 1600 or 2000 cells to a colony of L. depth, when we do not need, if the view be correct, that number of cells. But perhaps it may be asked, "Why not cut down the L. depth?" We are doing it in the Danzenbaker hive, to a certain extent, but we can not get bee-keepers who are already using L. depth (and we would not if we could), to go to the great expense of changing over their fixtures for the shallower depths.—Ed.]



May-day! twine to the top, with flowers sweet,
The May-pole's stately shaft;
Let children laugh as did their sires
When they, around it laughed.

Sombody says queens' wings need not be clipped—just slit them in the direction she walks, near the outer edge, and she will preserve her beauty, and yet not be able to fly a foot.

Now that the question is settled as to the damage bees do *not* do to fruit, let's determine what good they *do* as fertilizers of fruit-blossoms. The picture on page 339 would be a good starter for "Vol. I. No. 1."

Will bee-keeping die out as the country becomes settled? is now debated. It is settled, and yet the honey crop increases with civilization. Without doubt, Colorado alone produces more honey, from artificial sources, than was produced in the entire United States in 1850. Its use, too, is fast becoming more general.

Mr. F. Greiner sends us the following in regard to the adulteration of honey in Germany. It is a very welcome addition to this department, with more to follow.

The chemists in Germany have not yet been able to discover a reliable method to detect adulteration in honey. Mr. Kaempf, of the Pure-food Commission, says in the April issue of the *Leipziger Bienenzeitung*, that he collected samples of honey, taken from the stores in Koenigsberg, and submitted them to the Agricultural Experiment Station for analysis. The chemist of the station was to work on these samples for four weeks; and although it was evident that many were adulterated, only one of them could with any degree of certainty be pronounced as such, others receiving the attribute "suspicious."

Dr. Klien, it seems, took a great deal of pains in testing these different honeys by different methods. In testing a sample of suspicious American honey by the polariscope he showed the polarized rays turned to the left, as in pure honey. The alcohol test of pure basswood honey showed the same sort of sediment as in suspicious honeys.

The difficulty lies in the fact, so it is said, that different honeys differ in their composition, and for that reason the uncertainty. The chemist doesn't know where he is at.

The proposition is, first, to have as many samples of absolutely pure honey analyzed, each sample to be gathered from a different particular kind of blossom, as far as possible. Then when the chemist fully understands the behavior of the different kinds of honey, it is hoped he will be better able to detect adulteration. How anxious the German bee-keepers are about this matter appears from the fact that now a movement is on foot to raise a fund of \$250, this to be offered as a reward for an absolutely sure method of detecting adulteration of honey. Some liberal donations have already been made.

CENTRALBLATT.

A bee-keeper reports that he had a bad case of foul brood, in which half the brood was destroyed, and by the use of formic acid the plague was stayed and a perfect cure effected.

Corns can be removed by taking pure beeswax and spreading enough of it on a piece of paper to cover the corn, and binding it on for three or four days. At the end of that time the "hen's eye," as the Germans call it, can be easily removed. In some cases a second trial may be necessary. Another German bee-journal says propolis is still better for this purpose. Any thing that works will be welcome to most of us.

The Breslau *General Anzeiger* says that the adulteration of honey has brought a bee-keeper of Hennersdorf into a bad scrape. He procured of a foreign firm an enormous quantity of artificial honey, and sold it as pure honey. The police seized 1500 pounds of the stuff in the hands of the rogue. The event has created great excitement in apicultural circles, as such adulteration has been the means of a decline in the price of pure honey.

"Rose honey" sounds very attractive, and should not fail of its object, at least its high-sounding name should not, even if the artificial product itself should prove to be a disappointment. What is rose honey? asks the *Lux. Bienenzeitung*. It says: Take four parts of white potato syrup, one part of pure honey, mix thoroughly, and add two drops of warm honey-water to the mass, and—the rose honey is ready! Selling price, 36 cents a pound; cost price, 6 cents—a slick profit.

LE RUCHER BELGE.

Mr. Theodore Hercher, of Pfanzwibach, Austria, has a hive made from the hollow trunk of a tree, and in this bees have been kept since 1767—a period of 133 years, and not a colony has ever died in it. As to old combs, Mr. G. de Layens says, "Apicultural writers continue to assert that it is necessary to renew old combs. Here is a fact which destroys this old prejudice." I will not give the "facts" here, but suffice it to say that some European bee-men think combs may be used indefinitely.

The editor asked Mr. Rauschenfels, the editor of *L'Apicoltore*, the chief bee-journal print-

ed in Italian, if he had ever seen in Italy bees having only one or two yellow bands. He says: "I have seen them with one yellow band, but very rarely. They more frequently have two more or less yellow." Mr. Chas. Dadant, writing on this subject in *Revue Internationale*, says, "I have already noticed that drones from imported Italian queens are more or less yellow, and at times entirely black, as the queens themselves happened to be. I have introduced into my apiary more than 2000 Italian queens since I began importing, and I have never yet found a single queen producing regularly drones that one could consider as Italians, judging by color."

BRITISH BEE-JOURNAL.

The following, relative to the poison of the bee, appeared originally in a German bee-journal. It was translated by Mr. R. Hamlyn-Harris. It seems to throw some additional light on this subject.

The inflammation and other unpleasant symptoms which usually appear after a bee sting are often attributed to that sharp acid so widely distributed in the animal kingdom, and known under the name of formic acid. This fluid, however, has nothing to do with the swellings; its utility to the bees is of quite another character. Professor Joseph Langer, of Prague, a little while ago, examined the contents of the poison-glands of 25,000 bees. This he found to be a clear fluid, soluble in water, tastes bitter, and has a pleasant aromatic smell, which, however, soon passes away; this scent can not, therefore, be the poison. The formic acid which gives its peculiar acid reaction to the contents of the gland is also very evanescent. The contents of the gland itself retain their poisonous properties, however, even when dried and subjected to heat. The poison is, we therefore suppose, a vegetable base, an alkaloid, as the most active poisons in the vegetable kingdom are known to be.

Professor Langer proved that the poison has no effect whatever on a healthy skin; if, however, injected under the skin, all the symptoms of bee-stings set in. Should it reach the larger veins or arteries it causes a general disorder of the system which reminds one of snake-poisoning. The weight of the poison injected into the wound made by a bee's sting is between $\frac{1}{1000}$ and $\frac{1}{2000}$ part of a gram. The largest part of this is formic acid, which is such an important factor for the well-being of the bees. This works as a means of preserving the honey, owing to its acid reaction. The bee allows a little formic acid to fall into each cell filled with honey before it is closed or sealed, and this small quantity is enough to prevent fermentation. Honey extracted from unsealed combs never keeps long unless 0.1 per cent formic acid be added, which is all that is required.



THOROUGHbred QUEENS.

What do we Know about them?

BY ARTHUR C. MILLER.

The excellent article by Mr. H. L. Jeffrey, on the "Value of Breeding-stock," Feb. 1, is most timely, and touches a subject which needs to be more generally written about and discussed. The editor's comments were a surprise to me, for I had presumed that, of course, he was familiar with the subject of biology.

Evidently he is not alone in his position, for an inspection of the text-books and journals reveals a grievous lack of familiarity with such authors as Huxley, Darwin, Spencer, Haeckel, and others in the same field. Prof. Cook, although referring to some of them, does so in only the briefest way, while the Revised Langstroth has but a footnote by Mr. Dadant on in-and-in-breeding, p. 87. Aside from the foregoing there is virtually nothing in our text-books which tends to call the student's attention to even the existence of laws of heredity, to say nothing of their application. If the authors of our text-books are silent on these subjects, and if the editors of our journals are ignorant of them, it is not to be wondered at that the thorough breeding of queen-bees is in a much mixed and unsatisfactory condition.

Apparently very few of the rearers of and dealers in queens know what "thoroughbred" means, yet their advertisements would lead one to believe that they did, and that they were, consequently, familiar with the laws of heredity and the steps necessary to turn them to their advantage. When a queen-rearer who is ignorant of these laws, or who, knowing them, ignores them, advertises choice-bred queens and breeding-stock, he is doing a direct injury to the bee-keeping industry. The use of the terms "choice bred," "straight golden breeders," "breeding-queens," etc., implies that the person claiming to have such stock has produced it according to the well-recognized laws of breeding; that for many generations the ancestry of this stock was pure and potent, and that these "breeders" will produce offspring which, when properly mated, will maintain the same traits as their parents, with virtually no variation. Just how many queen-rearers care to affirm that for their stock?

"Thoroughbred" is not "crossbred," as any high-class stock-raiser will testify. Thorough breeding is cautious, careful, scientific in-breeding (do not confound this with in-and-in breeding); and when alien blood is introduced the result can never be foretold with certainty, the chances being toward *atavism*, the reverting to a previous type.

Let those queen-rearers who would progress, read and re-read the very best authorities on biology which they can get, and then let them try to apply what they have learned. The works on the subject are many; and unless the student is enthusiastically interested by the time he has read two or three of the leading works he had better drop the business of stock-rearing, for he will never win fame or be truly successful at it. The true stock-breeder is an enthusiast of the first grade, of high ideals, exhaustless patience, and a determination which nothing can waver; and I believe the love of it must be born in one. I do not think it can be acquired.

Will the editors of our journals and the authors of our text-books please own up to what they know of this subject? and will those of them who are posted kindly give us articles which will arouse the whole fraternity?

It is high time we began to be scientific in

our work. The haphazard, guess-at-it rule-o'-thumb ways have prevailed altogether too long. We shall injure ourselves, and be held accountable by those who follow us, if, knowing, we do not set about to overcome the evils.

Providence, R. I., Feb. 26.

[Very recently my attention has been called to a series of articles in the *Jersey Bulletin* on the subject of in-breeding to get prize-winning stock. I was surprised to note how the breeders of high-class Jersey blood in-breed. In one or two instances I noticed that a mother had been bred to her son, and sisters to brothers, for the express purpose of accentuating certain desirable traits. I observed, further, that this practice has been carried on to great advantage for many years.

Bee-keepers have much to learn from the breeders of other fine stock. But we have one difficulty to contend with, and that is, that of getting a particular queen mated to a particular strain of drones. Hitherto no certain method has been known for accomplishing this result, except having, at great expense, the mating take place on an island or in some isolated place on the prairie. If we can bring about the union of queens and drones in confinement, as was described recently on pages 347 and 348, we should assuredly make an effort to in-breed on the lines already indicated.

Here is another article on the same subject.—Ed.]

MEASURING BEES' TONGUES.

Objections to the Steel-rule Method; Scientific In-breeding; Long Tongues and Five Bands Combined.

BY J. H. GERBRACHT.

Mr. Root:—I inclose a slight correction to your comment on Prof. Rankin's article on page 84. The principal importance of this correction is that as Mr. Rankin has probably measured many other lots of bees, the correct ratio between the results obtained by the different methods is a matter of more or less interest; and as there was a difference in the tongue-reach of the two lots it is only fair that the comparison should be made with the right one. As a matter of fact, the different parts of a bee's tongue are not always in the same proportion, so that the results of such comparisons can not be relied on; and I will say that, in my measurements of the two colonies, using the same method as yourselves, the difference in average tongue-reach of the two colonies measured by Prof. Rankin was a trifle over .02 inch.

In the letter that accompanied the second lot of bees (the ones on page 924), I ran up against the difficulty of not making myself clearly understood. Those "924" bees were the progeny of a *daughter* of the queen which put up the 240 lbs. This daughter was discarded, after laying about two months, on account of lack of prolificness.

Incidentally, with just two exceptions, every queen that I had last spring met the same fate, though not for the same cause, for

the five-banders were prolific enough (their only good quality). The majority of their successors are from my own "best" one; the rest are about evenly divided between daughters of a selected "Superior" queen and one of your own red-clover queens that I was lucky enough to secure before their discovery. This red-clover queen's bees average about .002 inch less than my best one, and the Superior bees are just the same. There are no other Italian bees in the neighborhood; and with this kind of queens and drones it will be tough luck indeed if I do not have a few extra good specimens to show for next season's work.

I think I will say a word right here about in-breeding. There is not in existence to-day a single strain of unusual superiority of either cattle, hogs, or chickens, in which this principle has not been employed to secure a fixed type; and after this has been done, the fixed type can be maintained only by the most careful and scientific line-breeding. Crosses between different strains produce just the same unreliability and tendency to degeneration as crosses of distinct breeds do, except in the few cases in which, either by accident or the exercise of most unusual good judgment, the two strains happen to "nick" well. In cattle and swine breeding, the infusion of one-eighth new blood is considered enough to offset whatever ill effects close in-breeding may produce, the idea being to use the least possible amount to maintain the vigor and stamina, with as little disturbance of characteristics and type as possible; and the success of the breeder depends to a great extent on his ability to do this accurately. In poultry-breeding, particularly in the varieties which have variegated plumage, in-breeding and line-breeding are the only ways by which any fixity of type can be secured; and some breeders boast of not having gone outside of their own yards for breeding-stock for twenty years. Of course, the results are sometimes the same as those attained by some breeders of five-banded bees—good to look at, but of no utilitarian value; but this is by no means necessarily the case; and the best laying and most vigorous-growing stock we have to-day is from this same line-breeding.

There is no earthly reason why we should not have straight five-banded bees, of the highest type of working qualities; and the fact that, as a class, they are what they are, is a most humiliating confession of the standard of efficiency of some of our queen-breeders.

To get back to the original proposition, I will say that many of the results obtained depend upon the way bees are chloroformed. Too much chloroform, or too long exposure to a moderate amount, has a drying effect, causing the bee's tongue to lose in a great measure its elasticity. I obtained much the best results by placing the bees in a bottle instead of a cage, and consequently the stage of asphyxiation could be watched and controlled to a comparative certainty; and I found that a piece of common wrapping-twine dipped $\frac{3}{4}$ of an inch in chloroform was about right for a half-pint bottle, the twine being long enough

to be suspended from the cork. After going over every colony I had, and measuring over 800 tongues, keeping a record of every measurement, I am certain that the heart-to-heart truth of the matter is that the length which a bee's tongue will reach can no more be ascertained and measured to a certainty than a similar piece of rubber. The crying need of the time is for a standard reliable glossometer in which the bee does the measuring; and until this is had, the results at present obtained can be regarded as only temporary makeshifts.

Spring Grove, Ill., Feb. 11.

[See footnote to article by A. C. Miller. With regard to the subject of measuring bees' tongues, I may state that I have taken the bees of our \$200 queen, for instance, and measured them two or three different times from as many different cages, and the results were the same— $\frac{21}{100}$. Afterward I did not know but some one else would get a different result, and therefore I instructed one of our men, Mr. R. G. Calvert, how to measure, and then told him to go and get the bees himself and measure their tongues. I did not tell him what measurement I had secured from this particular colony, as I wished to see if he would get as long a reach as I did. He measured one or two cages of these bees, and the result showed that he got $\frac{21}{100}$. I was satisfied. Occasionally we find a colony where there is a variation of $\frac{20}{100}$ or $\frac{22}{100}$, but not often.

As to a glossometer and its use, here is an objection that occurs to me: The bees will eat through the meshes of the screen, perhaps a dozen or so of them at a time. The distance from the wire cloth to the honey, after it is eaten down, will be the length of the tongue-reach, of course. Now, suppose there is a variation in the length of the bees' tongues of that particular colony. Obviously, the glossometer will show *only the longest tongue-reach*, and *not the average* of the whole colony. Some one else suggests letting the bees of a whole colony reach through the wire cloth screen until they have eaten the honey from under it down to a certain level, and then measure from the top of the wire cloth to the surface of the honey. Here again we are getting only the reach of the longest tongues, and perhaps there might be only a hundred bees in the whole colony that would have this reach.

I have experimented a good deal with chloroform, and I do not find any great variation in results if the chloroform is used properly. I put a very little of the liquid on a common handkerchief. The wet spot is placed right over the wire cloth of a cage of bees. In a few seconds I raise the handkerchief and look into the cage. If the bees are not wholly under its influence I let it remain a few seconds more. But in any case the handkerchief is left on only long enough to stupefy; and, while the little carcass is still quivering with life, it is dissected. The head is removed, and the tongue stretched on the micrometer scale, as I have explained on page 101, Feb. 1, and again in this issue, page 399.

Much inquiry has come as to where these

steel rules or scales could be had. Hitherto I have referred our friends to the large hardware stores; but finally we have been compelled to get a stock, and are now in position to furnish them, having hundredths of an inch marked on one side, for 40 cts. postpaid by mail. A magnifying-glass and two large darning-needles, and a penknife with a sharp-pointed blade, are all that is absolutely necessary to complete the work of measuring.—Ed.]

COMB HONEY VERSUS EXTRACTED.

Comb Honey Scarce, but Extracted Becoming a Drug in the Market, at Low Prices; an Important Suggestion for the Consideration of Extracted-honey Producers; a Valuable Article.

BY HENRY SEGELKEN.

The season for 1900 being practically over, it occurred to us that it might be of interest to bee-keepers in general to learn our experience for the past two seasons regarding the sale of comb honey as compared with that of extracted. While the crop has been short for the past two seasons—in fact, almost a total failure in many sections of the country—we had no trouble whatever in securing all the extracted honey we could handle, and had an abundant supply; but our receipts of comb honey fell off to a very great extent, and we were unable to supply a large number of our customers, and outside trade in particular.

Large quantities of extracted honey of the 1899 crop were carried over, while, in the early spring of 1900, the markets were practically bare of all grades of comb honey, and prices were well kept up. Our market, at present, and we think all Eastern markets, are well cleaned up of comb honey, and prices are well maintained. This can not be said of extracted. More or less will be carried over this season, unless sold at reduced prices. Within the past two weeks extracted has declined about one cent per pound, and the indications point to a still further decline.

We believe it is generally claimed among bee-keepers, that, by producing extracted, they can produce twice the quantity they could if they were producing comb honey, and that, therefore, extracted could be sold at half the price of comb. Perhaps this is true, and for the past few years prices have ruled accordingly—extracted honey selling at from 5 to 8 cts., and comb at from 10 to 16, as to the various qualities. It must be borne in mind, however, that prices of extracted have not always remained firm, while on comb they have. Besides, as said above, we found no trouble in securing all the extracted we required, and could have handled thousands more crates of comb, but it was not to be found. Therefore it seems to us that it would be beneficial to the bee keepers if they would cut off the production of extracted honey to some extent, and produce more comb. If not in general, we would certainly make this suggestion to the bee-keepers of the East, and especially to those living in the large buckwheat

sections of New York—the “Buckwheaters” as they have been termed.

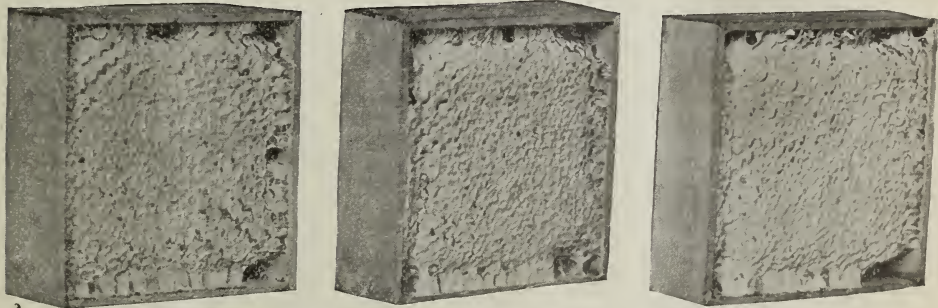
The outlet for extracted buckwheat is very limited, and we have noticed a general falling-off in the demand of late years, which is very likely to continue. We do not believe that we shall ever have such a demand for buckwheat extracted again as in former years.

Now as to buckwheat comb. We could not fill our orders in the season of 1899, and have not been able to supply our customers from the beginning of the season, last fall. Extracted honey we can get from all over, while we had to depend largely on the East for comb honey, though we have been receiving some comb honey from the South—Florida, Georgia, North and South Carolina—for the past two years, where the production of comb honey seems to be increasing. However, as this is ready, and sent to market in the late spring and summer, it is generally disposed of before the Eastern honey comes to the market, and, therefore, will not conflict with the increased production of comb honey in the Eastern States.

city. We have heard them universally well spoken of by bee-keepers everywhere; and because this is so it is a pleasure to speak of them in this connection.

We believe Mr. Segelken is right in saying that too much extracted honey is being produced for the Eastern markets; and it would be well if some of the producers of the liquid article would turn their attention toward the production of comb honey—something that always does have a sale, and at a great deal better prices than extracted, as a rule. In Cuba, bee-keepers are beginning to learn this same lesson. But there are some honeys which, if put on the market in the comb, would have little or no sale. Such honey is used only by tobacconists, bakers, and the like, for manufacturers can not use honey in the comb. As a rule we may say that, when honey is rank in flavor, and is not used by consumers direct in the extracted form, it should not be marketed in the comb.

Our honey-man, Mr. Boyden, has been saying for some time that bee-keepers were making a mistake in putting so much of their



A SAMPLE OF CUBAN HONEY IN PLAIN SQUARE SECTIONS.

We have just received from Cuba a shipment of comb honey, in plain square sections, 28 to crate, with glass front, packed in shipping-cases with handles. The honey arrived in first-class condition, and is nice and white. We think this is the first comb honey ever shipped from Cuba to the United States. We have noticed some correspondence in GLEANINGS by Cuban bee-keepers, wherein they say that all they receive for their honey is about 3 to 3½ cts. per lb. At this we should think that it would pay them to produce comb honey, for, instead of figuring on twice the price for extracted, they could safely figure on three times the price at least. There seems to be no doubt that comb honey could be produced in Cuba to advantage. Whether it will be done extensively is another question, unless American bee-keepers follow it up. In the course of time, however, Cuban comb honey may become quite a factor on our market, to be reckoned with; but we think that that time is, as yet, at a distance.

New York, Mar. 6.

[Mr. Henry Segelken is one of the firm of Hildreth & Segelken, a concern that handles such large amounts of honey in New York

product into extracted form—that there ought to be a larger per cent of it in comb. As Mr. Segelken's experience is quite in line with our own, bee-keepers may well consider how they shall put out their honey for the coming season.

I suspect that one reason why buckwheat extracted and other dark grades do not sell as they formerly did is because of the large importation of Cuban extracted honeys of better flavor and of better color. The buckwheaters of New York may well consider the matter of producing honey in the comb.

There is another reason why the darker grades do not sell as well as they formerly did, and that is, the general distrust against all honey in the liquid form. Consumers, as a rule, are getting to have confidence in honey put up in comb, as they believe it to be pure, in spite of the yarns that were circulated a few years ago over the country to the effect that comb honey could be successfully counterfeited by means of appropriate machinery.

Mr. Segelken sent us a photo of some of the Cuban honey to which he refers in his article, and this we have reproduced for the inspection of our American honey-producers. If the Cubans are finding it to their advantage

to produce honey in comb, how about us who are on American soil? While the great bulk of Cuban honey goes to other countries rather than to the United States, it behooves us here in America to be ready to meet competition that may come in time from Cuba.—ED.]

A CO-OPERATIVE ORGANIZATION FOR BEE-KEEPERS NEEDED.

BY J. P. BERG.

Friend Aikin, on page 82, has hit the nail on the head. Sitting on his ridgepole as he does, he has taken a full view of the matter. Such an organization is absolutely necessary for bee-keepers to prosper in the future. See how all business is organizing in its various lines, except the bee-keepers and farmers in general.

Now for the farmers. I have given up all hopes, on account of the total ignorance of so large a share of them. You can never educate them, as a class, to be honest with each other, and have confidence in each other, like other business men. And what is the result? Farming is the poorest-paying business in America. And we bee-keepers (I am a farmer too) are served not much better. Seven years ago I moved to the State of Washington with 110 colonies of bees. I sold my honey that fall before I went there, in Traverse City, at 18 cents a pound, wholesale. I bought good pine lumber for 12 to 14 dollars per 1000. I bought my nails to make my bee-hives for 2½ cents per lb. Two years ago I came back from there, and found honey worth 12½ cents, and many sold it for 10; but the lumber I had bought 5 years before for 12 to 14 dollars was worth \$26.00 to \$28.00, and nails were worth 5 cents per lb. Did they run short of material for nails? Our bee-supply manufacturers were obliged to raise prices on nearly all supplies, on account of raw material rising in price. Has the price of honey raised correspondingly? All the lumber men of this part of the country have their monthly meetings here at Traverse City. In their December meeting they passed a resolution that none should be allowed to lumber this winter more than half as much as they did last winter. Do you see, brother bee-keepers, how they fix us? This seems to be the order of the day: "Limit production and raise the price." Let us organize thoroughly and systematically for co-operative business as well as intelligence. Let's not be afraid that some other bee-keeper might get a dollar out of it that we should not get. This is the snag that all farmers' organizations go to pieces on—miserable jealousy and distrust. Is it not more profitable and honorable to give a faithful officer \$1.00 than to give a dishonest dealer \$100? I have more hopes of the bee-keepers getting together than the farmers, for the bee-keepers as a class are better informed, and have more confidence in each other. But, as Bro. Aikin says, "We must have a national head," and should attend to it at once, before another crop comes on.

Traverse City, Mich.

FERTILIZATION OF QUEENS IN THE HIVE.

Truth or Heresy—Which?

BY H. L. JEFFREY.

[In publishing the following I do not wish to be understood that I am in any sense giving it editorial endorsement. While I believe Mr. Jeffrey is honest, yet I can not help feeling some mistake has been made. On the other hand, there is just a little danger that over-conservatism on this question may shut us out from receiving new knowledge of unorthodox truth. Some thirty odd years ago there was a great deal said on this question, and some even claimed that fertilization could and did take place inside of the hive; but at the time, I believe it was finally decided that no really authentic proof from careful and competent observers was offered. While I believe that fertilization might take place in a mammoth cage, as illustrated and described last issue, I feel very, very skeptical about the possibilities of the act taking place *within* the hive.—ED.]

Mr. Editor:—Dr. Miller writes, "That dead decayed thing that has been carried out and buried comes up smiling." Not dead but sleeping. That mating queens in confinement is and has been made practical is true, and has been made practically a success, is also true, and was proven fully possible away back in the '70's by a man named Cooke, of German-American ancestors, who lived in Beacon Falls, Ct. Cooke did not use any big cage or tent, but I do know that he made a reasonable and practical success of it. He worked at it for several years, and tried to get the results of his labors published, but none of the publications would give him a fair showing. In every attempt he made to publish his works, he met with sarcastic rebuff. Finally he became despondent, and died in the early '80's. The minute details of his *modus operandi* I never tried to ascertain until too late. For three or four years he mated queens for me with drones that I selected for him. He would succeed with from half to three-fourths of the queens that I sent him, and that was far more satisfactory than to run the chances of natural chance mating; and from some of the results of Mr. Cooke's labor was one of the main factors that made me believe—yes, and by which I know—that the damaging inbreeding clack is all a humbug.

So far as confinement matings of my own experience are concerned, I have been just successful enough so that I do know it can be done; but just how to succeed *every* time, I do not know how. Provoking success is the only fitting term for it.

Twenty years or more ago some writer in the *American Bee Journal* used these words, in meaning: "When both sexes and conditions are ready, mating will take place anywhere." I will give one instance out of many, to illustrate.

In 1884 I had a three-year-old queen I was using as breeder. Her own record, several of her sisters' and her mother's records were above the best average. From a batch of 30 or more I selected 8 that were very good resemblances of the old one. They were in two-frame nuclei, and were watched very closely. On the evening of their seventh day they were closely examined, as they had been every day, and they showed that uneasiness that is ap-

parent the day before they mate. Drones from the old queen that were of even coloring, maturity, and size, a good many of them, were caught and put into the hives the nuclei were put in. Each comb in every nucleus was closely looked over by three or four of us. The combs were wedged firmly to one side of a 9-frame hive, leaving a half-inch space between them; $\frac{3}{8}$ inch from the combs was keyed a division-board just one inch shallower than the combs. A board cover was put on with wire cloth, covered with thin muslin that covered the open space of the hive. Thus the 8 nuclei were left to quiet down over night. Between 7 and 8 o'clock the next morning these nuclei were all carefully examined to see that every thing was all right. Then the entrance-closing blocks were screwed on, also the covers. The 8 hives were then loaded endwise into the body of a platform spring wagon. All were then pushed into the shade

sult, the same thing resulted. Hive after hive, the whole eight had mated and clipped queens. Each hive and queen was very carefully and cautiously examined in the morning before starting, and the drones were as carefully selected. That was a successful confinement mating.

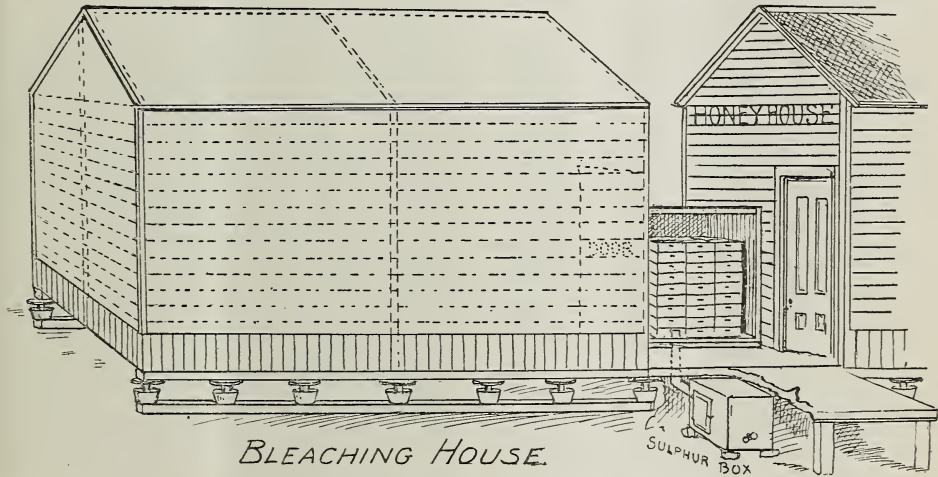
Woodbury, Ct., March 21.

BLEACHING COMB HONEY.

How it is Done on a Large Scale in California.

BY D. A. HIGGINS.

I make a house expressly for bleaching the honey. I first build a floor upon legs, as you see by the drawing, each leg having a tin can at the bottom, and a tin plate at the top. These legs are placed between two plates of



D. A. HIGGINS' COMB-HONEY BLEACHING-HOUSE.

to wait till other things were made ready. Every thing else ready, we (two besides myself) all drove to a selected place that, with diligent search, gave us sole possession of the locality, so far as bees were concerned. The load was left in the cool shade, then other preparations were made. Between 4 and 5 P. M., the bees having become quiet, the hive-stands all ready, and various other work all done, we proceeded to take the hives of bees from the wagon, place them on their stands, and carefully examine them one at a time.

Hive No. 1 being set on the stand, I took a screwdriver to take off the entrance-block, then the top board. The two assistants, one on each side, in a squatting position, in dead silence, watched. A dead and mutilated drone in the open space of the hive, also several others with protruding genitals, greeted our eyes; and on looking up the queen she was plainly ticketed as evidence. It took but an instant to take off her wings. Then hive No. 2 was brought forth; and with a little more caution, and more concern for a hoped-for re-

redwood, 2×4 inches, and 14 ft. long. At every 2 ft. I have a sleeper so as to make the floor strong. These sleepers are placed on these plates so that the legs are one. I have no underpinning under the center of the house. This is to keep out all mice or ants, which are very troublesome in this country, and they are especially troublesome in comb honey. The little tins at the bottom of the legs are filled with crude oil to keep out the ants, and the tin plate at the top keeps out the mice.

This house is covered with cloth, the top being heavy goods. Now we have the bleaching-house complete. On a platform in front of this house I build my surplus-box, 2 ft. wide and 6 ft. long. I next take one joint of stovepipe and cut a hole in one end of a square 60-lb. tin can, large enough for the pipe. One end of the pipe I insert in the can, and an elbow on the other end, and communicating with the sulphur-box. I now cover the pipe with earth about 6 inches deep. I next cut a hole in the side of the can, to put in sulphur.

I now take a large teacup of sulphur and place it in the can, and we then are ready to sulphur the honey.

THE METHOD OF BLEACHING.

I take my supers from the hive, place them on a wheelbarrow, and wheel them to the sulphur-box. Place them on the box until I have 30 supers, then I light the sulphur and let it stand for about three hours. I next wheel them to the bleaching-house, and place on the work-tables, which I have on both sides of my house, and reaching full length of the house. I now remove the honey from the supers and place it on shelves which run around the house, and are indicated by dotted lines. I leave them there about 24 hours, and then reverse the section and leave about 24 hours longer. I find that where the honey is badly stained it will now be very white.

It is necessary to have a good quality of sulphur, as it does not injure the honey, and the honey will bleach much nicer. It is the light which bleaches, so the cloth must be thin. The sulphur-box should be outside of the house, for it would be impossible to work in the house while sulphuring if the box were inside. This bleaching-house is very convenient if one does not sulphur his honey, for the reason one can store on shelves of a house 12 X 14 ft., about 100 cases of comb honey, giving plenty of time to clean and pack the honey.

Bonsall, Cal.

[There are some who are inclined to believe that there is not much in this bleaching business. Very recently we received a letter from one of the extensive and prominent bee-keepers in the East, stating that he was making bleaching a success. Comb-honey producers had better wake up to the fact that a great deal of their off-colored comb honey can be made A No. 1 by the proper use of sulphur and sunlight. It appears that bleaching in California has been extensively practiced for a number of years.—ED.]

MOVABLE COMBS V. MOVABLE FRAMES.

The Invention of Movable Combs in Germany; the Position that Dzierzon and Langstroth Occupy in Apicultural History.

BY DR. C. C. MILLER.

I have read with care your footnote on page 219, Mr. Editor, relating to the claims of Langstroth and Dzierzon; and, aside from inferences that may be drawn, there is nothing in either the Straw or the footnote that needs correction except one thing, and that is the statement that Dzierzon gave the movable frame to a large part of the bee-keeping world, instead of saying he gave the movable *comb*. So incorrect a statement as that can hardly be excused in one who parades himself before the world as knowing something of bee-keeping and its history. It may, of course, be said in extenuation that "movable-comb" and "movable-frame" are very commonly used as meaning the same thing, but that can not be accept-

ed as any excuse whatever. They *are* the same when you are talking about a Langstroth hive, because the movable frame, of necessity, makes the comb movable; but when speaking of Dzierzon's invention, how can there be a movable frame when there is no frame at all? It is a case of carelessness so glaring and culpable that there is no refuge except in the claim of stupidity. I don't know whether I'd rather be called careless or stupid, so on the whole it may be the best thing for me to say nothing, merely hoping to live down the disgrace, trusting that a forgiving public may forget all about it before I get to be an old man.

Having disposed of that one point, there still remains a certain amount of ignorance and misunderstanding that makes it desirable that the whole truth, so far as possible, should be brought out. Suppose you allow me to try to give what I understand to be the truth; and if I make as bad a break as I did before, you straighten me out.

If you ask a bee-keeper in this country who invented the movable comb he will promptly tell you it was Langstroth; and the chances are one out of five, if not one out of three, that he will have no idea of any thing that stands to Dzierzon's credit, if, indeed, he knows that such a man lives. Unfortunately there are some, perhaps more than you would suppose, who would reply something after this fashion: "Oh! there's a lot of them. Mr. Langstroth invented one movable frame; Mr. King invented another, and I don't just know who else, but a whole lot of them," ignorant of the fact that in reality all movable frames are Langstroth's invention, and may properly be called Langstroth frames, no matter what their proportions.

Ask a bee-keeper in Germany who invented the movable comb, and he will very likely reply, "Dzierzon;" and when you say, "What about Langstroth?" he will stare at you. The fact is, there is too much ignorance and narrowness on both sides of the water; and before blaming too much the Germans for not crediting to Langstroth what fairly belongs to him, I should like to see my own countrymen do full justice to Dzierzon.

Allow me to disabuse your mind entirely, Mr. Editor, of any thought that I would pluck one leaf from the laurel that crowns the brow of our own Langstroth. Probably more than you and I appreciate the debt we owe him for movable frames, for you did not begin *bee-keeping with box hives*. Neither do you estimate as highly as I do the superiority of Langstroth's invention over that of Dzierzon. You say, "Dzierzon improved on this by using bars in a top-opening hive." Instead of being top-opening, his hives were side-opening, each comb being put in a little after the fashion of a drawer in a bureau. His frame (if you will allow me so to express myself) had neither bottom-bar nor end-bar, only a top-bar; and when a comb was to be taken out it had to be cut loose from the sides of the hive, and no comb could be taken out till all that preceded it were removed. When the tenth comb was to be taken out, instead of lifting out that comb

alone, as you and I do, he was obliged first to cut free and take out the first nine before he could reach the tenth. Langstroth gave us a system that, compared with this or any previous system, was revolutionary, making the work of bee-keeping so easy that, if it were taken away from me to-day, and I were allowed the benefits of any one or all of the other systems, earlier or later, I should not be likely to continue a bee-keeper. I think you will now see that there is no quarrel between us as to the credit due Father Langstroth.

It detracts nothing from Langstroth's glory to give Dzierzon his full meed of praise. You refer me to *American Bee Journal*, Vol. I., p. 14. I do not find there the sentence you quote, but it is none the less true. I do find there this sentence that you have partially quoted: "The next invention, and that which alone received general approval and acceptance in Europe, was Dzierzon's movable-bar hive, first publicly announced in 1845." Please note that, although this was a bar hive, it was an improvement on all previous *frame* hives. Note, too, that it was the only system that received general acceptance, and especially the fact that it *did* receive general acceptance. Putting that in different words, it means that Dzierzon gave to German bee-keepers a movable-comb hive that went into general use, and meant for them a grand step forward — was, indeed, a revolution.

You will say that Langstroth's hive was ever so much better than Dzierzon's. Certainly. As I have shown, I hold that with still stronger emphasis than you. But that does not change the fact that Dzierzon gave the Germans a movable-comb hive that they accepted and adopted, and they are in use to this day. Langstroth gave us a loose hanging frame, and we think him entitled to no less credit because we now have something better in the fixed-distance frame. Dzierzon gave Germany the movable comb, and he is entitled to no less credit because they now have something better in the Langstroth frame. If Langstroth's invention had never been made they would still be using Dzierzon's, as, in fact, some of them are; and we should also be using Dzierzon's in this country, and giving Dzierzon the credit honestly due him.

I suspect that the main trouble in the case is that, in this country, we look upon Dzierzon's invention as a thing not really practical, and bunch it along with those of Huber and others. Instead of that it stands on a different plane entirely. It was and is a practical thing, and some of those who adopted it and became accustomed to it can not see enough better in the Langstroth invention to warrant them in making a change. Please set this down as a fact: Not Langstroth, but Dzierzon, gave to Germany a movable comb, and later the improvement of Langstroth was introduced. Mr. Samuel Wagner is quoted in Dadant's *Langstroth* as saying that the best test of the value of Dzierzon's system was the results; and then he tells how, after suffering a loss of more than 500 colonies in one year, he made a threefold increase to nearly 400 colonies.

The latest number of *Revue Internationale*

quotes with apparent approbation from *Centralblatt* the statement that Dzierzon's movable comb worked a complete revolution in bee-keeping. The *Revue* is edited by the able Edouard Bertrand, who is the publisher of the French edition of Dadant's *Langstroth*, and entirely familiar with the whole matter.

In a nutshell the case stands thus: Langstroth gave to America the movable comb, and Dzierzon gave it to Germany.

Going back to the original proposition, I feel very sure that, if you were to make a tour among German bee-keepers, you would agree with me that no other living man has done as much for bee-keeping as Dzierzon. If you know of one, Mr. Editor, will you kindly name him?

Marengo, Ill.

[Now that you have been confessing error, and eating a little humble pie, it may be well for me to do a little of the same sort of thing. I was in error in stating that Dzierzon used movable combs in a top-opening hive. The real facts, as I get at them, are these:

Della Rocca, in Greece, first introduced movable combs. These were built to bars, but the attachments to the combs had to be cut from the sides before they could be taken out. Dzierzon took this same idea, as it was not practicable to cut the bottom attachments in a top-opening hive, and applied it to a side-opening hive, just as you state. But I do not see any real invention in this, but only a very slight improvement. Dzierzon did introduce, probably, the idea of movable combs to the German bee-keeping public, in the same way that A. I. Root introduced the honey-extractor in America, although it was invented by Hruschka. But there was no invention in this on our part, neither was there on Dzierzon's, as I see it. Della Rocca, as it seems to me, really invented the movable bar nearly 50 years before Dzierzon made use of it.

Huber, about the same time that Della Rocca gave his movable-comb hive to the world, brought out his leaf hive, or what embodies the essential principles of the "closed-end" frames of the present day.—ED.]

DZIERZON'S MOVABLE-COMB HIVE.

In your remarks about Dzierzon, p. 219, you are right in the main points. Dzierzon never invented a *frame* hive. Bars with combs attached to them were used by the old Greeks. This and Della Rocca's invention were entirely forgotten when Dzierzon, in 1845, invented his *bar* hive. As the combs had to be cut from the sides of the hive, he made a door to it and opened it like a wardrobe. This made it easier to cut the combs from the side of the hive, than by handling the combs from the top of the hive as he did at first. This hive and Dzierzon's management of the bees started a new era in bee-keeping in Germany, as did the Langstroth hive in America. So far it is proper to say, Dzierzon is the inventor of a practical bee hive with movable combs. In 1850 Baron von Berlepsch invented and used a frame with a bee-space all round in the same Dzierzon hive. At about the same

time, Langstroth invented his hive and frame. I do not think it matters any whether one invention is a few days earlier than the other, as both hives are different in many respects. If you say the Berlepsch hive is *no* practical hive, I can't agree. Of course, we prefer our American hives; but in Germany the Berlepsch hive, with some modifications, is still in general use, and I myself handled bees in such hives for about ten years. It is said, before the frames were invented the comb-bars were used in England and by Langstroth. It would be interesting to know whence Langstroth received the idea of using these bars. Did he know of any thing of Dzierzon's hive, or was his (Dzierzon's) *bar* a successor of Della Rocca's invention?

To go back to Dzierzon, he was opposed to *frames*, and always recommended his bars, till about ten years ago, when everybody in Germany used frames; and even his nephew, who manages Dzierzon's apiary, persisted in using *frames* instead of bars. Since this time, Dzierzon is silent about the demerits of the frames. If we know this, it sounds like a joke to call Dzierzon the inventor of a *movable-frame* hive. L. STACHELHAUSEN.

Converse, Texas, March 25.

[I received your note after I had prepared the footnote above. From the general facts that I was able to glean I took it that Dzierzon got the idea of the use of the bar from Della Rocca, as the former, apparently, had not kept his light under a bushel; but Dzierzon doubtless made the use of the bar practical. But when we see the very wide gap between the Dzierzon movable combs, and the Langstroth movable frames, we are forced to the conclusion that Langstroth made a practical invention—one that revolutionized bee-keeping *all over the world*, while Dzierzon improved an old device that advanced bee-keeping but slightly and in only one country. I do not mean to detract from the glory that really belongs to Dzierzon, but I do believe that credit should be placed right where it does belong, irrespective of the living or the dead.—ED.]

POLLEN, AND HOW THE BEES GATHER IT.

Wintering Indoors with a High Temperature;
the Secret of Success.

BY IRA BARBER.

Our sleighing has just left us—one continuous run from the middle of November until April 4, and still there is snow in places four feet deep on some of the roads.

The bees appear to be all right up to date in winter quarters, for we have not had a day when bees could fly with safety since last November.

I see in the *American Bee Journal* Prof. Cook's criticism on bees using their tongues to gather pollen, and claims they never do. Now, that is one of the many mistaken ideas that he tries to give us. Bees have to apply honey to all the pollen they gather, whether

it is from the flowers or from the corn or oatmeal that we give them, as every pellet of pollen is made into a little sweet cake when it is gathered; and how does Prof. Cook think it is done if the bee does not use its tongue to apply the sweetening?

I am much interested in the few colonies of bees in the little room you describe that is located within a room, where fresh air does not reach them.

Now, you have just the place to prove to your own satisfaction that bees can be wintered in a high temperature, and come out better and stronger in numbers than when they went into winter quarters. To do this it will take two or three winters to get the right number of colonies to heat the room to the right degree; and I can assist you to get a start in the right direction next fall. This winter you did not have bees enough in the room to raise the temperature; but next fall put in twice as many, so that every colony will have from one to two quarts of bees standing out on the hive at all times, no matter how cold it is outside; for when bees furnish their own heat, and are not affected by outside currents of air, I have always found them quiet and apparently happy, for they appear to be just as you find them on a warm muggy morning in August, when nearly every hive is half covered with bees, and they appear to be half asleep, so they are in winter quarters, as I found them in all the years that I wintered them in a high temperature, heated by themselves.

I always used a small ventilator—a three-inch pipe thirty or more feet long, and ventilated from the top of the room that the bees were in.

DeKalb Junction, N. Y., Apr. 9

T. F. C., Pa.—Referring to your inclosed clipping in your letter of the 9th, the idea that bees become intoxicated is rank nonsense. Bees will sometimes, when they are sick or diseased, behave as described in the clipping. It is doubtful if any honey-producer told any reporter that bees become drunk on the nectar of flowers.

H. W. C., Iowa.—My faith in self-hivers is very weak. There have been a dozen different devices invented, and some of them are in the United States Patent Office. The best one I ever saw or knew of is the one devised by E. L. Pratt, at that time of Beverly, Mass., now of Swarthmore, Pa. I think it would pay you well to look up the Patent Office records on this subject before you consider getting out a patent. If you desire to send a model to us, express prepaid, I will examine it and report what I think of it. But I am afraid my prejudices are rather against it than in favor of it, if any thing. If you consult most of our practical bee-keepers I think they will tell you you had better let the subject alone if you wish to save yourself expense. It is possible to hive swarms automatically, and the writer has hived a good many that way by the various devices; but if you will take my advice you will let the whole subject alone.

EXTRA LIGHT-WEIGHT FOUNDATION FOR THE BROOD-NEST.

Light and Heavy Weights on Wires; Vertical vs. Horizontal Wiring; Valuable Experiments.

BY J. M. RANKIN.

The manufacture and use of comb foundation dates back only a few years, and yet it is an exceptional thing to find a man who does not believe that this manufactured article is a money-maker. He has but to try it once for himself, and its advantages are so apparent that it needs no comparison to show him that it has been an advantage for him to use it. There has, however, been much discussion as to what weight to use. The wax from which the foundation is made is the expensive part of the article, and so the lighter the weight the more foundation can be made from the same amount of wax with little more expense. The lighter the weight, of course the thinner must be the foundation.

The object of this experiment was to determine how light this foundation could be made and still serve the original purpose, namely, to furnish a base strong enough to answer all purposes.

The foundations used were furnished by The A. I. Root Co., and were about as near perfection as it is possible to make a foundation. The weights used ranged from a grade a little heavier than that commonly known as medium brood down nearly to thin surplus or six Langstroth sheets, which would be 5.49 sq. ft. to 13 Langstroth sheets, or 11.89 sq. ft. to the pound.[]

The foundations were all used in full sheets, but with different methods of wiring, namely, vertical and horizontal. Five vertical wires in a Langstroth frame, bringing them 3.5 inches apart, were used. In the frames wired horizontally, four wires were used, and were just drawn tight but bearing very little strain.

The fittings of the hives used in this experiment are shown in the following table. The foundations are numbered 6, 7, 8, etc., according to the number of L. sheets in a pound.

	Sheets of fdn. No. 6 in hive.	Sheets of fdn. No. 7 in hive.	Sheets of fdn. No. 8 in hive.	Sheets of fdn. No. 9 in hive.	Sheets of fdn. No. 10 in hive.	Sheets of fdn. No. 11 in hive.	Sheets of fdn. No. 12 in hive.	Sheets of fdn. No. 13 in hive.
Hive A	4							4
Hive B	2				4	2		
Hive C		2					4	
Hive D		4						4
Hive E			4					
Hive F					4		4	
Hive G			2	2		2		2
Hive H			2	2		2		2
Hive I				4		4		
Hive J		2	3	1		1		1

It may be understood, unless otherwise stated, that in each hive one-half of the foundation of each kind was wired horizontally and one-half vertically.

Hives B, C, G, and J were used as extract-

ing-supers. Swarms were hived on all the rest.

Detailed records are as follows: Hive A, 24 hours after the swarm was hived the bees were working freely on the No. 13 foundation, and but sparingly on the number 6. In 48 hours all but the outside frame of No. 13 foundation was drawn, and contained nectar and a few eggs, while the two outside frames of No. 6 foundation were nearly untouched.

In four days after hiving, no difference could be seen in the appearance of those combs built on No. 6 and No. 13 foundations, excepting that the combs of No. 13 were wavy where the vertical wires were used. That is, the foundations had expanded, and the bottom of the comb projected over the bottom-bar to the right between two wires and over to the left between the next two. The No. 6 foundation remained straight and even on the vertical as well as on the horizontal wires.

Hive B was put over a strong colony at the beginning of the clover flow. The bees began working in it immediately. The No. 6 foundation was placed at the side of the hive. The No. 11 next, and the No. 10 on the other side. In 48 hours it was impossible to tell from the looks of the combs which was the heavy and which was the light foundation. In this hive was the only case where a foundation as light as No. 11 was not wavy on vertical wires.

Hive C was also an extracting-super. Bees began work on No. 12 foundation first. The colony did not fill all the combs with honey, and at the end of the season the two frames fitted with No. 7 and one fitted with No. 12 foundation contained no honey, and were only partly drawn.

Hive D, swarm was hived on these combs late in the season, July 20. No. 7 foundation was on one side of the hive and No. 13 on the other side. Bees began work on No. 13. At the close of the season the outsides of the outside frames of No. 7 were still empty and but slightly drawn. The vertical wired combs of No. 13 foundation were very wavy, but the other two could not be distinguished from the combs built from the No. 7 foundation.

Hive E. Swarm hived early in the season; foundation 8 on one side the hive and foundation 12 on the other. Bees began work in the middle of the hive, and showed no preference for either weight. The vertical wired sheets of No. 12 were wavy, but those wired horizontally could not be distinguished from the No. 8 foundation.

Hive F. Heavy swarm hived June 29 showed no preference. Vertical wired frames of No. 13 foundation were wavy, but those wired horizontally could not be distinguished from the No. 10.

Three days after hiving, hive G was put on as an extracting-super. The bees there showed no preference, and at the close of the season there was an empty frame on each side of the surplus case. One was a frame of No. 8 foundation, and one was No. 13 foundation. Both were partly drawn.

Colonies which had been infected with foul brood were shaken into hives H and I the

same evening. They were confined for 24 hours and released at evening. In neither hive was there any preference shown. The combs were all drawn out and nicely finished.

Hive J was used as a surplus case, and but very little work done in it, owing to the sudden breaking of all the flow.

In general we learn from the experiment that, for a light foundation, vertical wires are not as good as horizontal ones—four horizontal wires serving all purposes, even with a light foundation. The combs from light foundations, when built on vertical wires, were wavy in every case.

The bees seem to prefer, and certainly do not object to, the lighter foundations. Why they seem to prefer the lighter foundations I do not know unless it is because it is easier remodeled to suit their fancy.

It requires much more care to put these light foundations in the frames and properly imbed the wires than it does the heavy ones—the No. 13 especially.

This experiment was made in hives that were painted white, but standing directly in the sun, and in no case was a frame of the lighter foundations melted down.

Agricultural College, Mich.

The result secured in this set of experiments is somewhat of a surprise to me. I should have said, if my opinion had been asked, that the heavier grades of foundation would be accepted by the bees first; and that on the light weights, 10 to 13 sheets to the pound, a perpendicular wiring would necessarily have to be used to prevent a horizontal sagging. If it be true that we can use, for the brood-nest, a foundation running from 10 to 12 sheets to the pound, we will say, and if it is also true that we can use horizontal wiring, thousands of dollars will be saved to the bee-keepers of the land annually. The manufacturer can make a brood foundation running from 10 to 12 sheets to the pound*; but hitherto we, like all of them, have supposed that such a light weight would not be practicable for the brood-nest, for fear that the foundation would stretch in drawing out, making elongated cells in the resultant comb. The season is right now on us; and any one who desires to can easily conduct for himself some experiments along the line above indicated.

I have always advocated a horizontal wiring, but supposed that such wiring would be applicable only to a foundation not lighter than 7 to 8 sheets to the pound; but from some experiments I made a number of years ago with the perpendicular wiring, I am quite prepared to believe that Mr. Rankin is correct in stating that a horizontal wiring will be better for even the light weights of foundation; and, come to think of it, the experiments of Mr. Rankin agree very well with those of Mr. Wm. W.

*These light weights must have thin bases, and plenty of wax in the walls. It is not easy to make such foundation, but it can be made, and the Root Co. have made it, and can make it if there was a call for it in quantity. We are making tons and tons of 9 to 10 sheets to the pound. And even this weight we did not consider practicable at one time.

Whitney, as given in GLEANINGS for March 15, page 223.

Mr. Rankin and Mr. Whitney have drawn attention to some very important possibilities.

If I mistake not, the Michigan Agricultural College has not regarded experimental work in apiculture as particularly important; but the work that Mr. Rankin has already done in the matter of measuring bees' tongues, and in showing the possibilities in the use of light-weight foundation, is of the very best, and sufficient to warrant the continuance of the experiments, for he is a man who is eminently fitted to do work of this kind.—ED.]

MRS. JACKSON'S BEE-KEEPING.

What a Woman can Do, and a Woman in Poor Health at That.

BY MRS. GEO. JACKSON.

In the fall of 1894 one of our neighbors, several miles away, called on us in the firm belief that he could sell us some bees. Mr. Jackson, being fond of honey, favored buying them; but I, not caring for honey, nor having any faith that they would amount to any thing, did not take kindly to the idea. Nevertheless, the neighbor, being a good talker, and telling us a nice little "busy bee" story, succeeded in selling us four colonies, and those bees were the best-paying investment we ever made.

When we set them out of the cellar, April 10, 1895, we had only two colonies, two having died during the winter. We knew nothing of the care of bees, and had only one swarm thrown off during the summer; but a nice supply of white honey came, that even I had to own I liked, and it made us quite enthusiastic on bee culture.

In the spring of 1896 we found the two old colonies in good condition, but the new one very weak, owing to a poor hive and lack of knowledge. The hives were home-made square ones.

We now thought it time that we knew something, and sent to A. I. Root for his A B C book—the next best investment we ever made; also five of his Dovetailed hives, and a smoker. But before receiving the goods I was taken sick, and was very sick for several weeks, not fully recovering until late in the season, and we think much credit is due the bees for my final recovery, I being much interested in them. I studied my book and studied the bees. The result was, in the fall I had seven strong colonies and an abundance of beautiful white comb honey. Mr. Jackson now gave up all claim to the bees, reserving only the privilege of eating the honey.

My seven colonies wintered well, and I had learned my book well during the winter. In the fall of 1897 I had 18 very strong colonies, and about 900 lbs. of comb honey. The bees again wintered well, and in the spring of 1898 I had still 18 strong colonies. Well, I felt, and do still feel, proud of those bees. They commenced work the first day they were out of the cellar, and worked every pleasant day

during the summer, and until heavy frost came in the fall. One colony, the "Queen" of my apiary, did itself "proud." During the season we took from it *ten supers* of well-filled and nicely capped white honey, each super containing 24 lbs. It did not swarm, and we had a heavy flow of basswood honey. The other colonies swarmed early, and the 10th of June I had 37 strong colonies. I did not get less than two supers of honey from any colony, and many of them four.

Summit City, Mich., Feb. 11.

[In my report of the convention at Traverse City, Mich., page 158, I spoke about the remarkable yield secured by a lady present, and she only a beginner. I have asked her to write it out, which she has done as above.—A. I. R.]

THE DICKEL THEORY.

What do we Know about Parthenogenesis and other Mysteries of the Hive?

BY F. GREINER.

A human being is naturally of an inquisitive mind; and when any thing is presented to him which has the appearance of being unreasonable he at once wants to know the hows and whys. In the case of parthenogenesis, it does not make any material difference whether it is acknowledged that *all* eggs laid by a normal queen are fertilized, and therefore contain sperm, or whether it is believed that only those eggs destined to become queens and workers enjoy that preference or privilege. Your bees will make you just as much or as little honey in the one case as in the other. Yet, we do not rest easy until we know what the exact truth is. If we bear in mind that all *good* people *seek* the truth, we ought to be willing to show not only charity to those who arrive at different conclusions, but we ought to even encourage them. If we have that feeling we will welcome Mr. Dickel, who has for years been trying to clear away mysteries surrounding the so-called Dzierzon theory, or parthenogenesis.

According to Webster, parthenogenesis means "the virgin production of living beings." Probably all of us have had unpleasant experiences with *laying* workers. I emphasize the word "*laying*," because many a time laying workers are called fertile workers. Even Prof. Cook names them so in his work on bees. That is a misnomer. We call a normal queen a *fertile* queen—she is impregnated, has met a drone. In this sense the laying workers are not fertile, for they are incapable of mating. Laying workers generally make their appearance in hopelessly queenless colonies, seldom at other times. The worker bee is so constituted that, in an emergency, she can lay eggs. She may have retained this faculty as an inheritance from most remote ancestry. These eggs, however, produce only male bees, apparently perfectly developed. A queen, when by chance she has not become impregnated, lays eggs exactly like those from

laying workers. A failing queen may also lay eggs which produce only drones, though they may have been deposited in worker-cells like the others. These facts were first discovered by Dr. Dzierzon, of Germany, in 1845, and are acknowledged the world over. Dzierzon further claimed that all drone eggs lacked the sperm, and that the queen could *at will* lay fertilized and unfertilized eggs.

It seems to be a law of nature among bees and fowls that the female offspring resembles the father and male offspring the mother. For example, I have crossed pure breeds of fowls. The pullets of a Langshan-Plymouth Rock cross were as black as the father, and, when matured, I was not able to tell them from the pure-blooded hens. The cockerels resembled the mother-hen, but were a little darker.

It may be Dr. Dzierzon was influenced by similar observations. If it was true that the drone originated from an unfertilized egg, then the drone would always be as pure-blooded as the mother-bee, regardless of how she had mated, and queen-breeding to a feather would be a heap easier than it would be otherwise.

What is our experience? I have had a good many mismated black queens and some mismated Italians queens. My observation leads me to the belief that the drones are slightly influenced in color, showing that of the father, in some instances at least. I do not say that all drones do, but only a part of them. Mr. Doolittle also holds the opinion that, by mismating, a queen is contaminated as regards all her offspring, both male and female.

After Dzierzon proclaimed his theory that all drone-producing eggs were unfertilized, a severe fight ensued. It had been an undisputed scientific truth, a law of nature, "No life without fertilization." Even in the vegetable kingdom this law holds good. The pistillate strawberry-plant remains barren unless the pollen from a perfect-flowering plant reaches its ovaries. The Dzierzon theory upset this acknowledged truth completely. No wonder it met with opposition on every hand. After an undecided war, something happened that should end all further dispute for the time being. Prof. Siebold made a microscopic examination of bee-eggs taken from drone and worker cells at the apiary of Baron von Berlepsch, in Seebach, Germany. The eggs from drone comb contained no sperm, but those from worker-cells did. From this time on, parthenogenesis, in the Dzierzon sense, has been accepted by all people of all countries.

It excites the curiosity of the unprejudiced observer that, at no time, verifying examinations have been undertaken since, although the theory is of a rather uncommon—yes, unreasonable—character. This thought instigated Dickel to investigate the matter. Siebold had made his examinations in late season, when, according to Berlepsch, there were no drones being raised in healthy colonies of his apiary. The locality of Seebach furnishes no late honey. Early in July the season closes, and, in consequence, the breeding of drones is discontinued, and drones and drone brood

is killed. Berlepsch had one colony in his yard which, from early in the spring, had been determined to supersede its queen; but, by continuously removing, the queen had been kept from accomplishing the object. Berlepsch had at different times during the season removed or destroyed the drone brood in this hive. At the time when Prof. Siebold came into the apiary it had again plenty of drones in all stages, and all the drone eggs used for the examination were taken from this colony. There is no certainty that they came from a normally healthy queen. On the other hand, we have reason to suspect that they could not have contained sperm, by reason of the failing powers of the queen who laid them, and of which Prof. Siebold himself said, "She was near her end." Taking this view of the matter we can understand why the other eggs taken from worker-cells, and used for examination, were taken from other colonies in a normal condition.

After ascertaining these facts, Dickel could not consider Siebold's conclusions as of any value, and went to work and did some experimenting. He put a colony of bees into a hive full of drone comb, and watched the behavior of the bees. Eggs appeared and disappeared again. It seemed the bees hardly knew what to do; but finally they did the best they could under the circumstances, and raised workers in drone-cells. Late in the season, after all desire had subsided to produce drones, and the hive was entirely free from drone brood, Dickel dequeened the colony and observed that not only queens were raised, but also drones, drone brood being sprinkled in among the worker brood here and there. From this he judged that all the eggs of normal queens are exactly alike, and may produce queens, drones, and workers.

The following experiment has repeatedly been tried by Dickel and others, and turned out the same in numerous reported instances: A piece of drone comb was taken containing young drone larvæ. These were very carefully removed, and worker larvæ substituted. The so-prepared piece of brood was given to a queenless colony having no other brood. The bees went to work and again raised queens, drones, and workers, all from worker larvæ. By this experiment it is shown that the sexual tendencies lie dormant in the worker larva till nearly the time it is being sealed, when, by some process not fully understood, the one or the other of those tendencies is induced to develop.

Dickel opposes the idea that a worker larva may be developed into a queen by the *difference* in the food the royal larva receives. He says there must be some other explanation of the mystery. A young Durham calf would sooner partake of the nature of a Jersey by bringing it up on Jersey milk. Indeed, there is something in this that might lead us to thinking. The two calves may be anatomically alike; but the queen and the worker show marked difference in their structure. A mere change of food does not generally produce such results, and I do not doubt that we do not fully understand this matter. Dickel has

his theory about *this*. He thinks the worker performs a sexual act by certain glands; a sort of developer, as the photographer says, is produced, which, when administered, affects the egg or the larva as indicated. Two glands are to perform the office; the secretion of one gland acts as a developer of the female tendency, while the secretion of the other gland acts as a developer of the male tendency; both together administered bring the worker into existence. In case of the true sex, individuals of the bee family, the drone and the queen, the development of the sexual organs begins when these secretions are first administered, and the queen and drone are still in the egg.

Bee-eggs, it is generally believed, can not be transferred, on account of the fragility of the egg. Dickel and some others claim that they have been successful in doing it. By transferring freshly laid eggs, untouched by the bees, Dickel says he has raised queens, drones, and workers, selecting eggs from the same class of cells.

No matter whether drones originate from eggs fertilized or lacking sperm, I can not think the queen knows what kind of egg she lays. I believe that an influence goes out from the cell, which causes the queen's ovaries, spermatheca, oviduct, and the whole apparatus to operate involuntarily.

Indeed, it would be hard to explain why a queen should consent to lay eggs in queen-cells, thus raising rivals, and possibly endangering her own life. Of the many queen-cups generally started in every part of the hive, many more than are ever actually used come in the way of the queen as she is traveling over the combs in search of empty cells, and she deposits an egg in them as readily as in a worker or drone cell, should she find any of them cleaned and primed, acting, as Dickel says, as an automatic egg-laying machine.

The true followers of Dzierzon are at present glorying over what they term "Dickel's capitulation."

Dickel is searching for truth; and when he discovers a fact, though it may testify against his theory, he is willing and anxious that that fact shall be known. In No. 11 of the *Hessische Biene* he has of late published the results of the latest microscopic examinations of bee eggs made at the University of Freiburg, Germany. Dickel himself furnished the eggs. In all, 272 eggs taken from drone-cells were examined, and 62 eggs taken from worker-cells. Among the first named, one egg was found to contain sperm; the 62 worker-cell eggs all contained sperm. One lot of eggs from drone-cells were purposely mislabeled by Dickel "worker-eggs," but the microscope could not be fooled.

So, then, so far, parthenogenesis has not been disproved by the microscope. I understand Dickel has not given up the fight. He proposes to continue in his work, and I have no doubt we shall hear from him again.

Naples, N. Y.

[I have been advised by some of my friends not to allow any discussion of the Dickel the-

ory to get into our columns, for the simple reason that it occupied an immense amount of space in the European publications, with the result that nothing was proved in favor of the new hypothesis. But when I attended one of the conventions in New York recently, I listened to an excellent paper on the subject by Mr. Friedemann Greiner. As he had discussed the matter so thoroughly and impartially, I requested the privilege of the publication of his paper, which privilege he freely granted. I have held the paper till now so it would be more seasonable; but in the mean time I have received from Frank Benton a translation of an article on the same subject. Both have been held, and are now given.—ED.]

ON THE THEORY OF PARTHENOGENESIS AMONG BEES.

BY CAV. ANDREA DE' RAUSCHENFELS.

Translated from the Italian, by Frank Benton, U. S.
Department of Agriculture, Washington, D. C.

[This article is translated from *L'Apicoltore*, Vol. XXXIV., No. 2, for February, 1901. Cavaliere Andrea de' Rauschenfels, the learned editor of this, the oldest Italian bee-journal, is the author of several valuable works on bee-keeping, and is one of the most eminent practical bee-masters of Europe. Being of Germanic descent he is thoroughly conversant with the language in which the main discussion of the Dickel theory was originally published. This short exposition by him of the latest phase of the matter is, therefore, a welcome contribution.—TRANSLATOR'S NOTE.]

Much water has rolled under the bridges since the lamented Don Lanfranchi, and, later, Mr. F. Dickel, undertook to revise the Dzierzonian theory of parthenogenesis among bees. The innumerable experiments carried out with admirable perseverance by the latter, and the deductions from these, treated with great acumen, and published in a very long series of articles in the *Noerdlinger Bienenzeitung*, then edited by him, and, above all, the eloquent exposition of the new theory (according to which the workers are the ones that determine the sex of the creatures developed from the eggs deposited by a fecundated queen, and therefore themselves, without exception like the latter, fecundated), made a great impression on the apiculturists present at the congresses of Cologne and Salzburg; the adherents were numerous, and the applause was entertaining.

Dr. Dzierzon and his followers combatted, naturally, to a man, the reformer; and the strife between the Guelphs and Ghibellines continued to rage more fiercely than ever in the journals, when there was brought forward by Dickel a formidable aid. His journal suddenly ceased publication, and with the journal this so *vexata questio* appeared to have been buried. It appeared to be so, but was not. Dickel continued his crusade in another journal, but the matter had lost its interest for apiculturists. This was not the case, however, among scientists. The zoological department of the University of Freiburg, in the Grand Duchy of Baden, had, for fully three years, been conducting investigations in regard to parthenogenesis among bees. The material

to be subjected to microscopic examination was furnished by the said Mr. Dickel. Out of 29 worker eggs in the first stage, 23 were found which contained traces of fecundation, while 94 drone eggs presented no such traces whatever; and among 62 eggs taken from worker-cells there was not found a single one which did not contain such traces, while of 272 male eggs one only showed a vestige.*

"How certain the method of examination practiced by the zoological department is," writes Prof. A. Weismann,† "may be inferred from the following: Mr. Dickel, who is not a microscopist, commenced during the time—certainly not short—occupied in the investigations, to doubt the full accuracy of the microscope in the solution of the questions concerning fecundation, something for which we did not reproach him, finding it, on the contrary, very natural. As he wished to put the matter to a test he changed the labels on the contents of two packages, the one with eggs taken from drone-cells and the other with eggs from worker-cells. This occurred when the results previously obtained had already fully convinced us that the eggs found in drone-cells are not fecundated. Hence we were not a little astonished upon finding in a new examination exactly the contrary; each egg which was supposed to have come from a drone-cell appeared fecundated, whilst none of those which, according to the label, must have been taken from worker-cells, contained a sign of fecundation. It was very natural to think at once that there must have occurred a chance error in labeling the contents of the two packages; and to ascertain this, an assistant, Mr. Petrunkevich, went to Darmstadt (Grand Duchy of Hesse-Darmstadt), to the residence of Mr. Dickel, and ascertained that the exchange of the labels had actually been made, and purposely. After all this," Professor Weismann concludes, "it may be taken as proved that the eggs deposited in drone-cells are normally not fecundated, while on the other hand, those deposited in worker-cells are always fecundated and that, therefore, the theory of Dr. Dzierzon remains unchanged."

But Mr. Dickel does not yet admit himself vanquished. Fecundation, he says, does not always depend upon the sperm, and he announces that, against the deductions of Professor Weismann, he will oppose other deductions.

Washington, D. C.

[I think we may safely say that the experiments conducted at the Zoological Department at Freiburg dispose of the matter, so far as the sex of the eggs is concerned, and it would seem as if the result of these microscopic findings, confirming as they do the findings of

*Although laid in a drone-cell this particular egg would probably have developed into a worker bee.—TRANSLATOR.

†Prof. August Weismann, the regular professor of zoology in the ancient University of Freiburg, is a celebrated evolutionist, embryologist, and comparative morphologist, whose researches and theories regarding the problem of reproduction, development, and evolution, place him among the foremost biologists of the age.—TRANSLATOR.

Siebold, knock the very props from under the Dickel theory. But there is one thing that still remains; and that is, Dickel maintains that the sex of the larvæ is changed after they are hatched from the egg, because he says that he can give drone eggs or worker eggs to a colony of bees, and, under the right conditions, secure from either set of eggs, workers, drones, and queens.*

While we do not care to go into a discussion of this matter, because we believe that that statement is not borne out in the experience of queen breeders in this country, yet I believe it will prove interesting to our readers to glance over briefly a subject that has occupied the attention of the European bee-keepers for so long a time.—ED.]



WORKING FOR COMB HONEY.

"Good morning, Mr. Doolittle. I came all the way from Iowa (by letter) to have a talk with you regarding how best to work for comb honey so as to be sure of securing a good crop should the season prove favorable."

"Not knowing your surroundings, etc., I will say that, to be successful, you must have a simple movable-frame hive of some kind. I formerly thought that there was nothing equal to the Gallup form of the Langstroth hive; but with years of working with the regular Langstroth hive at the out-apiary, together with cellar wintering, I am quite sure that the man who adopts the regular Langstroth hive and frame is making no mistake."

"How large a hive do you use?"

"In using the Langstroth hive I make the bodies to hold ten frames, and work all good colonies on the ten frames till the honey harvest opens, when the colonies are each confined to the number of frames the queen has brood in at that time."

"How do you manage to confine the bees on any certain number of frames, that number being governed by those having brood in them?"

"This is done by division-boards or dummies, as you have frequently read of in the bee-papers of late. The combs not having brood in them are taken out, and one of these boards put in the hive in place of each frame taken out. In this way the colony having brood in only six combs is as fully prepared for the honey harvest as is the one having brood in eight, nine, or ten frames, and will store fully as much in proportion to its numbers, according to my experience; while if the whole ten combs were left in the hive,

scarcely a pound of section honey would be obtained."

"But is this all there is to do to secure a good crop of comb honey?"

"By no means. But it is one of the very important factors in the matter."

"Well, what of the other factors?"

"All know that bees gather honey or nectar, instead of producing it, and that the eggs laid by the queen produce bees; consequently the more eggs the queen lays at the proper time, the more bees we have on the stage of action at the commencement of the honey harvest, and the more bees we have at that time the more honey they gather."

"That sounds very pretty."

"Yes. But it is a matter of fact as well, that the queen is really the producer of the honey; for without her no honey could come about, from lack of bees. Therefore, if we wish good returns from our bees we must see to it that we have good queens—queens that can be so worked that they will give us combs full of brood before the honey season commences, so that, when the honey harvest comes, these solid combs of brood, together with the boards taking the place of any combs not containing brood, will compel the bees to place the honey in the sections, as there will be nowhere else for them to store it."

"But how shall we secure combs full of brood and plenty of bees to do all the necessary labor, to secure the best results by the time our honey harvest begins?"

"As soon as spring opens, our bees should all be examined by lifting the frames in each hive; and any colonies which are weak in bees are to be shut to one side of the hive by means of one of the division-boards spoken of before, so as to economize the heat in the cluster of bees as far as possible, confining the bees to as few combs as have brood in them."

"But suppose there is not honey enough for food in the combs they are shut on?"

"In case there is not, I leave a comb of honey next to the side of the hive, and between that and the first comb of brood; and if a part of the cappings to the cells are broken a little on the side next to the brood it will help on the brood-rearing so much the more."

"How long do you keep them confined to these few combs?"

"Till the queen has filled them solid full of brood, and the bees begin to be crowded out beyond the division-board."

"What then do you do?"

"As soon as the queen has filled these combs, and the bees begin to be crowded on them, they are spread apart, and a comb of honey having the capping somewhat broken is set in the center of the brood-nest, or between those occupied with brood, and in a few days' time the queen will fill this also, and thus we are to keep on till all the combs the hive will hold are filled, or the honey harvest arrives, when, as spoken of before, the queen is now limited to as many combs as are filled with brood on the arrival of the honey harvest."

"Why do you put these combs of honey in

*If I mistake not, drone eggs have been repeatedly put into queen-cells, and each time a dead or cadaverous overfed drone, and only a drone, was the result.

There are other ways of explaining Dickel's observation on this point besides the one on the supposition of a new fact in science.

the center of the brood rather than on the outside?"

"Because the center of the brood-nest is the warmest part of the hive or colony; and this, with the removal of the honey, which the bees never allow (at this time of the year) in the center of the brood-nest, stimulates the queen to greater activity at egg-laying than otherwise would be, so that we are rushing on with mighty strides toward the army of workers which are to gather our nectar during the harvest time. To this one idea of securing workers in time for the harvest, every effort of both the keeper and the bees is to be directed at this time of the year if we would succeed."

"But do you not help some of the very weakest colonies any?"

"Yes. As soon as the strongest colonies have their hives full of bees and brood, or even when they have eight frames full, I take a frame of brood just gnawing out, and place it in the next weaker ones, giving the stronger an empty comb for the queen to fill again, and so keep on until all are full, if this is possible, before the harvest arrives."

"But does it not injure the strongest to thus take brood from them?"

"It would were we to do this early in the season; but as we do not do this till some of the colonies have their hives nearly or quite filled, it does not materially weaken them, but, on the contrary, stimulates the queen to still greater activity at egg-laying, and at the same time tends to check any desire to swarm."

"How about putting on sections? When is this done?"

"I generally put them on all good colonies a week to ten days before the honey harvest is to arrive, so that the bees may enter them on warm days and get used to going 'upstairs.' With the weaker colonies they are not put on till they are ready for them, or till they are confined to the brood they have at the time of the opening of the harvest."

"How are the sections prepared?"

"I now fill each section with the extra-thin foundation, while three or four sections to each hive should be those which are full of comb, or nearly so (called 'bait sections'), left over from the previous year, the same being those which were filled hardly well enough to be salable. These latter are very important, as they are the means of getting the bees at work in the sections at once."

"Are not these sections filled with comb finished quicker than those with foundation?"

"Yes. As a rule these are finished from three days to a week before the others; and where one has the time, I think it pays to take these out as soon as filled, putting those with foundation in their places, thereby causing the bees to work with renewed vigor to fill up the vacant space left where the full ones were taken out. But where time is scarce, or where sections are handled by the full super, this course can not generally be taken. This, in short, is the way I have worked my bees for the past 30 years, during which I have been enabled to take an average of very near-

ly 80 pounds of comb honey each year from each old colony in the spring."



HIVES ON A BENCH; ARTIFICIAL SUBSTITUTES FOR BROOD-REARING IN THE SPRING.

1. I have my bees on a 17-ft. bench; how close can I place them?

2. How long can a queen hatched from a cell be left in a cage?

3. Does a person gain any thing by feeding rye meal to his bees in early spring?

JOHN SCHNEIDER.

Manhasset, N. Y., Mar. 22.

[1. I would not place them much closer than about 6 inches. You will need room enough to get your hands down between the hives to handle properly. If you get the hives too close there is liable to be a little trouble from bees running from one entrance to the other, especially young bees. In the case of a valuable queen, I would not place the hive of such queen very close to that of another.

2. If supplied with candy she may live two or three weeks (possibly she might live that long without it, getting her sustenance from the bees), but ordinarily not more than four or five days. The older a queen is, the more difficult she is to introduce.

3. For the average beginner, I think not; but an expert may, perhaps, at times put out an artificial substitute that will prove beneficial. But as a rule we may say that natural pollen will come on as soon as the bees can afford to use pollen. The feeding of rye meal has a tendency to overload the combs and to stimulate brood-rearing at a time of year when it is too cold for bees to rear much brood *profitably*. More spring dwindling comes from a small cluster trying to hover over a large amount of brood in cool bad weather than from any other cause. In our locality we prefer to have brood-rearing *kept down* to as small a compass as possible, until the first of May; then the bees can usually take care of and keep warm all they will be likely to rear. —ED.]

THE SKIN OF FRUIT V. OLD BLACK CELLS.

I agree with you, that the bees never pinch a hole through the skin of a fruit, but I do not understand why they can *not* do it, as they are well able to cut down the cells of very old comb, and sometimes they will cut the septum also. Such old black cells, I think, must be nearly as tough as the skin of a fruit.

FERDINAND WAGNER.

Watertown, Wis., Mar. 21.

[Old black cells have considerable fiber in them; and, as I have before explained, the bees will pick to pieces a fibrous article just as we can pick to pieces with our fingers a ma-

nila rope. And, again, these old cells have cocoons imbedded in them. The cappings of brood-combs are almost entirely fibrous, with very little wax. But, you ask, why is it that bees can cut through the cappings of comb honey which are pure wax? In the first place, the mouth parts of the bee are especially formed for the working and handling of wax, a substance that is totally different from the skin of fruit. And, again, you will observe that the surface of comb honey is rough and uneven with slight excrescences, or what we might call minute mountains, hills, and valleys. These the bees can easily grab hold of and pull up. That is to say, they can tear, but they can not cut. Unless the wax has an irregular surface, the bees can not do any thing with it except under a temperature of from 90 to 100 degrees, and that is the inside temperature of the hive. It must be so soft that they can work it just as we work dough in the hands.

Reference has been made to the fact that bees will gnaw through enamel cloth. But I never yet saw any such cloth that had holes in it *unless* the enamel was cracked or rotten, leaving an edge which the bees could *get hold of* and pull, or the cloth itself were exposed so they could grab the fiber on the back. The surface of fruit is of a smooth semi-oily character. There is nothing for a bee to get hold of; but if the skin has minute rotten spots invisible to us but which the bees can see, or the skin is turned up anywhere so the bee can get hold of it with its mandibles it will tear it up; then it can go on and enlarge the opening to any size. Some have said that bees have the power, physiologically, to cut; but we are very sure of this: They have no conscientious scruples; for they will wade into the preserves of the housewife wherever they can in a dearth of honey. Whatever they *can do*, right or wrong, they will do it. The fact that no good proof has ever yet been advanced to show that bees *can* cut through sound fruit, goes a very long way to show that they can *not* do it.—Ed.]

EXTRACTING FROM PARTLY FILLED SECTIONS.

Please tell me how to extract partly filled sections. I have a No. 5 Novice extractor, and should like to know if there is any way to extract nice pieces of comb honey from old-fashioned box hives and partly filled sections.

FLORENCE L. TOWNSEND.

Zana, Texas, Feb. 11.

[If the sections to which you refer are the common $4\frac{1}{4}$ square, put them into a wide frame, and then extract as you would common brood-frames. But this involves considerable work. Comb-honey producers, as a rule, do not fuss to put their partly filled sections in an ordinary honey-extractor. A far better way is to set them into supers, then pile the supers up on one or more empty hives a few rods from the apiary.

The entrance to the hive should be effected by means of a very small opening, large enough to admit only one or two bees at a time. On

the principle of slow robbing described in our A B C of Bee Culture the bees will clean these sections out far cheaper than you can fuss to do it with the extractor, and possibly enable them, if your apiary is small, to complete other sections already on the hives.

It has been recommended of late to put all such supers containing partly filled sections in the cellar, leaving the outside-cellar door open. Every one of the supers should be uncovered or left so that the bees can get at them freely. The bees will soon find their way to the cellar, and then there will be a big uproar of robbing. But as soon as the honey has all been taken away, the robbing subsides, and all is quiet. I have never tried it; but Dr. Miller, who has, assures me it works all right. While I think the plan can be followed by expert bee-keepers, the one of stacking supers up in a hive with a small entrance is the one recommended for beginners.—Ed.]

HONEY PROSPECTS; ANOTHER VIEW OF THE SITUATION IN CALIFORNIA.

As the exact truth is better for all parties concerned, I wish to say that friend Mendelson *may* find that the few bees left in Southern California can more than supply local markets (page 194). Central California never had more bees nor better prospects, I think, for this time of the year. Where can we place, say, two train loads of extracted honey next fall? The annual report from Philadelphia is expected, showing that the market is ruined by commission men, but we must send honey somewhere. However, our continued rains are not going to make this a red-letter year from cause stated by Mr. M.

W. A. H. GILSTRAP.

Grayson, Cal., March 11.

REMOVING COMB HONEY FROM DOVETAILED SUPERS.

1. Will you kindly tell me how to remove the sections from the super (in a Dovetailed hive) when they are full of honey? We have had great difficulty in removing it because they were stuck together.

2. What is the best time of day to get the honey?

3. Is it necessary to cover the hive in winter?

B. A. JENNINGS.

Southport, Conn., Mar. 4.

[1. There ought to be no difficulty on this point if you are using the modern Dovetailed-hive supers, with super springs. With a screw-driver, loosen up the first fence or the first row of sections. Draw this out gently, and then all the rest will be free.

2. Along about the middle of the day, say after ten o'clock and before two, when bees are flying thickest.

3. The hives should either be protected by winter-cases or else be put in the cellar.—Ed.]

QUALITY OF RED-CLOVER HONEY.

Long-tongued bees are all right. I believe we can breed bees to a great improvement in this line; but, really, did any of you ever eat

red-clover honey that was good? Some years my bees gather quite a lot from the second-crop bloom when the weather is dry and the bloom stunted. I have also eaten red clover honey in Missouri, and it all tastes alike to me—like bumble-bee honey. Am I right, or is it owing to locality? M. F. TATMAN.
 Rossville, Kan.

[Yes, I have tasted what was said to be simon-pure red-clover honey. While the flavor is not quite up to that of white clover, yet I would call it good honey. If I could, by long-tongued bees, increase my honey-crop by 25 or 50 per cent of such honey, I should consider I was adding a big percentage to my income. Buckwheat honey has a large demand in the East, and I am sure red-clover honey would outrank buckwheat several times over.—Ed.]

HATCHING CHICKENS OVER COLONIES OF BEES.

I take the liberty to send you something new in the bee and poultry line. Please tell me what you think of this. What style of hive do you think is used? I have no bees—have always been afraid of them, but think I should like them if I could use them for hatching chickens. JESSIE NEILL.

Benzonia, Mich., Mar. 8.

John McDonald, three miles south of Mahalasville, has on his premises 12 stands of bees. The tops of the bee-hives are so constructed that they receive the proper amount of heat for incubators. These tops are filled with eggs, and all that is to be done is to see that the eggs are turned in order to have a fine brood of chicks. He experimented last season with good success, and this year has his hives made about two feet square, so that more eggs can be accommodated, and is going into the business on a large scale. It is claimed, and has been satisfactorily demonstrated by Mr. McDonald, that bees furnish exactly the required amount of heat for the hatching of the eggs.

[I have heard of this being done, and see no reason why it could not be done successfully, as the temperature over a powerful colony of bees is about the same as that under an old hen. But Mr. McDonald and everybody else will find out the bees can not maintain heat enough to keep their own brood thriving, and hatch hen's eggs at the same time. What is gained in chickens will be lost in young bees or something near it.

RESULT OF WINTERING BEES IN A CAVE BLASTED FROM SOLID ROCK.

You wished me to report how my bees wintered in the new cellar blasted out of the solid rock. I put in 32 colonies Nov. 20; took out 32 April 1, *all strong*. In the Portage apiary we put in 153; took out 149. In the Mauston apiary we put in 152; took out 146. C. H. PIERCE.

Kilbourn, Wis., April 8.

In paragraph beginning on page 225 I aimed to make it clear that the queen is left in the lower story and the extra brood is left to hatch in the third story and upward. The brood being left to stimulate the bees to greater activity is a help, in my judgment.

Grayson, Cal.

W. A. H. GILSTRAP.



W. J. S., Okla.—I should be inclined to believe that a distillery in the immediate neighborhood of the bees might be somewhat prejudicial to the business of bee-keeping. We once lost a large number of our colonies because the bees helped themselves liberally to the juices of the apples at a cider-mill. If the liquor that they get is alcoholic, then the effect on the bees is certainly injurious; but whether they would come to like it or not, I could not say.

E. W. L., Mass.—This question of how much freezing bees can stand is a hard one for even veterans in the business to answer. We only know this: That, the less exposure and the nearer the temperature is kept down to 50 deg. during the winter, the less the consumption of stores. The lower the temperature and the greater variation in temperature, the greater the loss in stores and loss in bees. If the temperature is too great, and the cold weather is long-continued, and below zero, the bees will succumb.

HOW THE TONGUES OF BEES ARE MEASURED AT MEDINA.

H. E. H., Fla.—All that is required to measure bees' tongues is a steel rule with hundredths of an inch marked off on one side; a glass magnifying five or ten diameters; a pair of tweezers and a darning-needle, and a dime's worth of chloroform. Put up about a dozen bees of mature age in a common mailing-cage. Avoid taking young ones, as the tongues of such are not quite as long as those that are able to go to the fields. Pour a few drops of chloroform on a handkerchief and lay this over the bees. In about a minute the bees will be sufficiently stupefied so they can be handled, and the tongues will, from suffocation, be protruded almost their whole length. Pick up a bee and decapitate it. Lay the head and tongue on the steel rule just above the graduations of hundredths, face upward. With one hand exert a gentle pressure on the head of the bee, and, with the other, comb the tongue out straight, using needles or tweezers in either case. The pressure on the face is to cause the tongue to protrude its full length. Now, while the tongue is carefully combed out, take the glass, focus it on the tongue, and count off the hundredths, beginning from the ends of the mandibles or jaws, and ending with the end of the tongue. Proceed thus with all the bees in the cage, putting down on paper the exact results after each measurement. Strike a general average, and this average gives the measurement by which we go. As a rule I find there is but very little variation in the tongue-reach of the bees in any one colony. Sometimes they are all alike; but in the case of some individual bees it is more difficult to get the tongue combed out its full length.



NATIONAL BEE-KEEPERS' ASSOCIATION.

OBJECT:—To promote and protect the interests of its members; to prevent the adulteration of honey.

OFFICERS:—E. R. Root, President, Medina, O.; R. C. Aikin Vice-president, Loveland, Col.; Dr. A. B. Mason, Secretary, 3512 Monroe St., Sta. B., Toledo, O.; Eugene Secor, General Manager, Forest City, Iowa.

BOARD OF DIRECTORS:—E. Whitcomb, Friend, Neb.; W. Z. Hutchinson, Flint, Mich.; A. I. Root, Medina, O.; E. T. Abbott, St. Joseph, Mo.; F. H. Elwood, Starkville, N. Y.; E. R. Root, Medina, O.; T. G. Newman, San Francisco, Cal.; G. M. Doolittle, Borodino, N. Y.; W. F. Marks, Chapinville, N. Y.; J. M. Hambaugh, Escondido, Cal.; C. P. Dadant, Hamilton, Ill.; C. C. Miller, Marengo, Ill.

FEES:—Annual membership fee, \$1.00. Remittances may be sent here or to General Manager as above.

DON'T fail to read J. M. Rankin's article on foundation, page 391.

To raise the freight rates on comb honey to *double first-class* as is proposed by the Western Classification Committee, "would strangle the honey business . . . on long hauls," says Mr. York. Bee-keepers should "line up" and fight for their rights. See Special Notices elsewhere, and then act in accordance with instructions.

The *American Bee Keeper* is rapidly forging ahead. In spite of the fact that its editor is hundreds of miles away, the editorials are a strong feature of our cotemporary. They are fairly redolent of honey, wax, and of propolis; and I should not be surprised if some of Bro. Hill's were written on hive-covers, with a pencil daubed with bee-glue. Bee-lore written under such circumstances is bound to smack of practical experience.

AMONG other publications, the *Country Gentleman*, one of the very best farm papers issued, contains a warning against spraying fruit-trees while in bloom. It seems as if by this time that all progressive fruit-growers and farmers, to say nothing about bee-keepers, ought to know that spraying during fruit-bloom, so far from being an advantage, is a positive waste of time and chemicals as well as a serious menace to the lives of their best friends, the bees.

THE question has been asked in some circles whether it is positively known that the spraying of trees during bloom actually does kill bees. The chemicals that are ordinarily used do kill them by the thousands. There have been numerous reports showing how almost entire apiaries have been ruined just about blooming-time. Strong colonies will suddenly begin to dwindle, and keep on dwindling until nothing is left but young bees. But, thanks to a good many of the farm papers, fruit-growers on every side are being informed of the uselessness of spraying during bloom, and the terrible destruction visited on the bees.

MR. HUTCHINSON says in the *Review*, "The *Rocky Mountain Bee Journal* is the best bee-journal that has been started in many a long year." I have been looking over several numbers of this new bee-paper, and conclude that Mr. Hutchinson's judgment is about right. It is a very creditable publication, well edited, and nicely printed. Colorado is one of the greatest honey-producing States in the Union, and it may possibly be the greatest one, in the aggregate of honey produced, before another decade passes by. There is a splendid field for bee-journalism up among the Rockies, and we wish our cotemporary every success.

OUR re-reviews of Prof. Cook's reviews of the A B C book, in the *American Bee Journal*, are not for the purpose of showing that Prof. Cook is *wrong*, as he appears to be in some of his points, but for the purpose of drawing out and calling attention to some important facts or truths. Prof. Cook's criticisms have been and are models of courtesy, and we intend ours shall be as much so. He has done much to enrich and add to our bee-literature, and I wish to say that there is very much of value in his criticisms on the A B C, in the *American Bee Journal*. In the revision of the new work, where the new edition has not already been corrected we shall keep his corrections before us.

THOSE BEES UNDER THE MACHINE-SHOP.

AT this writing we still have the bees in the cellar under the machine-shop, and they are wintering perfectly. Next year we shall double the number of colonies; and if the results in the future prove to be as satisfactory we shall find it to our advantage, doubtless, to winter all our bees that way. The fact that potatoes are stored in another portion of that cellar, and the further fact that it is necessary to keep this cellar as cold as possible, makes it all the better for the bees. The temperature goes as low as 40, and up as high as 55. When it is very warm outside, the outside windows are closed, and when it is cold they are opened; but if it becomes very cold, they are closed to prevent too great a drop in temperature.

THE HEAVY SNOW-STORM OF APRIL 20.

ON the 20th we had one of the worst storms, or what some might call a blizzard, that we have ever had. The snow continued piling up for 48 hours. While the temperature did not get below freezing at any time, yet the wind was very chilly and raw. From reports that we gather from the paper, it is evident that this storm is general. It seems to have made its appearance in the West first, particularly in Colorado, then veered northward. As it did not reach us on schedule time we thought it had spent its force; but, lo and behold! on the morning of the 20th it had circled around and was hurling its force with unrelenting fury on the Central and Eastern States. So far as the bee-keeping industry is concerned, it will do no harm. The very heavy snowfall

will have a tendency to wet the ground up in good shape for clover. For about two weeks back it has been getting to be very dry—too much so for the interests of bee keepers and farmers alike.

WINTER LOSSES.

COOL weather, with but few days for the flight of bees, has held on so long throughout the Northern States that I am fearful there are going to be losses in some sections. So far reports have indicated that the bees have wintered well in Minnesota; rather poorly in Wisconsin, and not extra well in Michigan. In New York the bee-keepers entertain some fears as to what the results will show when settled warm weather comes on. J. E. Crane, of Vermont, says bees have wintered poorly in his section. From the great mass of reports, I gather that, while the loss numerically of colonies in the apiary will not be so great, yet the strength of those colonies will be reduced down to nuclei in very many instances. I am rather of the impression that stimulative feeding will have to be practiced this spring. The season will be late, so also the natural nectar supplies. If we should have, from now on, steady warm weather, the bees will probably be able to make up for the losses they have sustained during the past month or so. As to our own apiary, while our loss of colonies has been very light, yet our Mr. Wardell reports that there are a large number of weak colonies in the apiary.

A DISTINCTION BETWEEN TONGUE-REACH AND WHOLE TONGUE-LENGTH.

JUDGING from the variety of advertising that is now current, it is very apparent that some of the advertisers are talking about the whole length of the tongue, and others of only the tongue-reach. One advertiser in particular talks about tongue-reach when I know he means the whole length of the tongue. Customers, unless breeders are careful in this matter, are bound to be disappointed, and declare that the advertiser is a fraud. Let us all be careful to distinguish between *tongue-reach* and the *whole length* of the tongue. As I have before explained, tongue-reach includes only that portion of the proboscis that extends beyond the jaws of the bee; in other words, it is the available length that the bee can actually use in reaching down to the flower-tubes of clover. So far as I know, the longest tongue reach yet recorded is $\frac{23}{100}$. What the longest actual whole tongue-length is I do not know, and I don't believe it makes much difference. But it is important to know *how far* a bee can reach into a flower-tube with its *tongue*.

DOES LENGTH OF TONGUE-REACH HAVE A DIRECT RELATION TO AMOUNT OF HONEY SECURED? A PLAN TO PROVE OR DIS-PROVE IT.

WE have had considerable proof thus far to show that the honey-yields of certain colonies is in direct proportion to the average tongue-reach of the bees. While the evidence thus

far received points that way, yet there is one thing that has not yet been done, and that is, to measure the tongues of *poor* workers. If their reach is short, then we shall have further proof.

Now, I wish to suggest a plan that will entirely eliminate any prejudice or favor. I would request that a number of our subscribers send us one cage of bees from the very best workers in their yards, and another from the very poorest. But this test will have no value if there has been a recent change of queens in either hive. The bees of either colony must all be from one mother, of course. If brood has been exchanged so that the bees are from two different queens in the one hive, we can prove nothing. Then I should like to have some others send another pair of cages, one of which contains bees that distinguish themselves on red clover; and the other one, bees that do absolutely nothing at such times.

At the time of sending these bees in, *letter or number the cages*, and do not tell which are the good workers and which poor; but let me (blindfolded, as it were) send in a report of their tongue reach. After you get my report, send it, with the information of which are the good and poor workers, to Dr. C. C. Miller, Marengo, Ill. I'll give him instructions to tabulate the report and send it to GLEANINGS.

It is so easy for any us to be swayed in the direction we wish to believe, that I want to make sure in this case that both prejudice and favor shall be entirely eliminated. While I think I could be unbiased enough to give the plain facts, yet there may be a good many of our subscribers who, believing me to be intentionally fair, would nevertheless feel that I would be unconsciously prejudiced in favor of the long-tongue theory. But when the returns are all in, I suspect that we shall find that tongue-reach does not always bear a direct proportion to the amount of honey that a certain colony will gather; but we may prove that it is an important factor along with other factors.

PROF. COOK'S REVIEW OF THE A B C REVIEWED.

IN the *American Bee Journal* Prof. Cook has another installment of criticisms on the A B C. These criticisms are not upon the latest edition, and the editor says, with good reason, that this may be preferable because of the large number who have older editions. Instead of taking the criticisms in the order in which they occur, it may be well to take them in classes.

In the first class are three palpable errors that have been corrected in the latest edition. Under the first two figures that occur in the article on Honey-comb, the letters A and B are wrongly placed. A should be under the circles, and B under the hexagons. In the first paragraph of the article on Honey-dew, "scab insects" should be "scale insects." Prof. Cook is good-natured enough to say that this error may be due to his own poor writing. In the list of honey-plants, "motherwort" appears as "motherwork."

The second class contains three errors not yet corrected. Instead of 53 *varieties* of goldenrod, it should be *species*. In the article on honey-dew, the distinction is not as sharply made as it should be between aphid (or plant-louse) honey-dew, which is, perhaps, never very bad, and coccid (or scale-louse) honey-dew, which is never good. In the list of honey-plants, Prof. Cook says "Burr marigold" should be "Burr marigold"! It is quite possible the printer in Chicago is responsible for this, the intention being to show that only one *r* should be in the first syllable. Even then it needs further correction, for in the dictionary it is bur-marigold.

A third class contains nine items which not all would agree with Prof. Cook in calling errors.

In the chapter on Italian bees occurs a picture of the abdomen of a worker, which is said to be "detached from the shoulders." Prof. Cook says, "This use of the word *shoulders* is not warranted by any good usage that I know of; and as *thorax* is a perfectly good word, I see no need of coining a new one." The word *thorax* is undoubtedly the better word for those who understand what *thorax* means; but all are not so familiar with the word as an entomologist like Prof. Cook, and it is a question whether a larger number of readers might not catch the correct meaning better with the word *shoulders* than with *thorax*. However, in the latest edition the objectionable word does not appear, the reading being, "the body of the bee detached from the abdomen," which might be marked for further change, so as to read, "the abdomen of the bee detached from the thorax."

Prof. Cook has grave doubts as to honey from any plant being poisonous. It is possible that there is no such thing as poisonous honey, but there certainly has been some strong testimony in that direction. At any rate, as said in the latest edition, "In a matter involving severe sickness or possible loss of life it would seem to be policy to err on the safe side," so there can be no very great harm in telling about the reputation some plants have as to furnishing poisonous honey.

Prof. Cook says: "Is it wise to say that ten-day queens may be just as good as any?" Analysis by able scientists show that, for the first three days, a worker larva is fed the same as a queen, so it *may* be that a larva not more than three days old is as good as any from which to rear a queen. Mr. Cowan and others say a queen emerges 15 days after the laying of the egg. So a ten-day queen would be started from a larva two days old—surely as safe as one three days old. Without intending to make it so, Prof. Cook has used such wording that it might be understood that the book favors these ten-day queens. On the contrary the book says immediately; "but to be on the safe side, I should prefer giving them larvæ one or two days younger." In the latest edition the reading is, "These ten-day queens probably are not as good as those reared from younger larvæ."

In this same connection Prof. Cook says: "When things are normal they start the queen

from the egg. I think the wise breeder will always do the same." He would hardly have said that if he had taken the pains to inquire as to the practice of Doolittle and the majority of our best breeders who start queens from larvæ, and not from eggs.

Prof. Cook thinks that, when a young queen begins to lay after eggs and larvæ are given, the laying is more likely a coincidence than a result, and says a good many experiments should be tried before reaching a conclusion. Certainly many experiments have been tried, for many have made it a practice thus to give young brood; but it is a difficult thing to say in any given case whether the queen might not have begun laying just the same if no brood had been given. But the fact that so many have tried it, and that few or no cases of failure have occurred, makes the probability lie strongly on the side of the belief of result rather than coincidence.

"That the thread which evinces that mating has taken place is absorbed into the body of the queen, I think very improbable indeed," says our reviewer. The A B C says in substance that, when the queen returns from her wedding-flight, the bees sometimes pull at the protruding substance, but it is probably eventually absorbed into the body of the queen; and the day after, all trace of it will be a shriveled thread. That is not saying the thread is absorbed. It may be, however, that, aside from the filling of the spermatheca, there is no absorption in the case.

Prof. Cook says, "I am not at all sure that bees do not communicate. . . . That they are one-idea insects seem also to me not proven." That last sentence evidently refers to these words of the A B C: "I am quite sure they are unable to communicate to each other more than a single idea." Whether more than one idea at a time can be conveyed may be a subject for difference of opinion; but the very saying that bees are unable to communicate more than a single idea is practically saying that they do communicate—a belief which is also to be seen on other portions of the page, making it difficult to see how Prof. Cook should be so inconsistent as to arraign the A B C for teaching that bees do not communicate.

"Here, again, Mr. Root advises the use of the lantern," says Prof. Cook. "I have tried the night-working with bees several times when necessity compelled it, and I should be slow to recommend it, especially to a novice." Prof. Cook is a stickler for telling the truth, and on this page the author simply tells the plain truth as to his own experience, without directly advising any one to imitate his example. If Prof. Cook failed, that does not prove that the author failed, neither does it prove that any one else would fail who should exactly imitate the author.

Prof. Cook is right in saying that formic acid is not a vegetable acid, the A B C being faulty in calling a vegetable secretion that which is secreted from rather than by vegetable growth. But both reviewer and reviewed probably need overhauling for talking about formic acid as the poison, when latest investi-

gations (were they by Dr. Langer?) have shown that the poison is something separate from formic acid.

"I believe that it is equally untrue that the poison is more pungent when the bees are working," says Prof. Cook. "If the poison is more irritating at one time than another, it is because there is more of it. . . . Yet I have my doubts in this matter. I have never known bees to sting worse, or the wound to be more painful, than in the autumn, when the harvest was all over." There is here a field for investigation. It would be an exceedingly difficult thing to make practical bee-keepers believe that the results of all bee-stings are alike. In fact, it needs only the outside appearance to show positively that they are not alike. Neither would it be an easy thing to make bee-keepers believe that stings are not different at different times. What makes the difference? Is it in the person, or is it in the quality or quantity of the poison?

Prof. Cook says, "I am surprised that our author teaches that stinging does not kill the bee. Who has not known cases where thousands of bees have died from stinging?" In reply to this question it may be said that it is doubtful that five bee-keepers can be found to testify that they know of a case in which a thousand, to say nothing of thousands, of bees that have died from stinging. It is no doubt an injury for a bee to lose its sting; but many cases have occurred in which a bee was known to live so long after losing its sting that it is doubtful that it can be truly said that "losing the sting means to lose the life." A few years ago we published a report from a bee-keeper who told how one of his colonies became so enraged that the individual bees of it stung every thing in sight; that after this colony got quieted down from its rampage it appeared on examination as if there was scarcely a bee left that had not lost its sting. Yet this colony, he says, lived and prospered, and that for weeks and weeks afterward those "stingless" bees were seen to be going to and fro from the hive as though nothing had happened. This remarkable report was later confirmed by another subscriber who had had a similar experience. But this is true: That a bee that has lost its sting, and that is subsequently caged in a mailing-cage with about a dozen perfect bees, may die in a few hours, and we have had them live two weeks, or as long as the other bees with their stings.

In the fourth class are two items in which the book is so manifestly right and the reviewer wrong that Prof. Cook will no doubt change his mind when his attention is called to them.

Referring to the picture of the glass rhombic dodecahedron, Prof. Cook says: "This figure appears to me like a small cube inside a larger one. I should consider it a right-angled figure;" and so he thinks the figure a failure. If Prof. Cook, with one eye closed, will look directly at the glass dodecahedron at the point where three faces meet, he will find that he can see exactly the form of a cube within a larger cube. The picture looks just

like the object; and if there is a failure it is not in the picture but in the thing pictured.

The word "jessamine" is called a case of misspelling. He says: "I think it is always spelt jasmine or jasmin." Certainly jessamine can not be spelt jasmine; so if there is any thing wrong it is not a case of misspelling, but of using the wrong word. There is no wrong word used; for under the word jessamine, in the dictionary, will be found: "The jasmine: a popular name, common in literature."

CONVENTION NOTICE.

Mr. Editor:—Many inquiries have been received by the Executive Committee of the National Bee-keepers' Association regarding the time and place for holding the next convention of the Association. The reply has generally been that Buffalo, N. Y., would be the place of meeting; but until this morning the date of meeting had not been settled upon.

On March 2d the Secretary of the American Pomological Society wrote President Root in part as follows:

"As bee-keepers and fruit-growers have many interests in common which could be considered and discussed with mutual profit, our Executive Committee has instructed me to extend to your Association a cordial invitation to hold a joint meeting at some time during our session, the exact time to be decided later by correspondence.

At this meeting we would suggest that the subjects of discussion center round the general topic of the mutual relations of bee-keeping and fruit-growing, which can be briefly treated by speakers selected in advance from among our prominent bee-men and fruit-men, in order that a better understanding of these mutual relations may be reached. It has been suggested that a considerable portion of fruit-growers do not yet appreciate the preponderance of the benefit derived. It is felt that a full public discussion of the subject would, therefore, result in good to both industries."

Realizing, as the Executive Committee did, that this was a golden opportunity for presenting the bee-keepers' side of the subject to the representative men of the fruit-growing industry, the invitation of the Pomological Society was at once accepted by the committee in behalf of the Association.

We have had to delay the fixing of the date for our convention until the Pomological Society had fixed their time of meeting. Our convention will be held on the 10th, 11th, and 12th of September next, commencing on Tuesday evening the 10th.

We were at first undecided as to place of meeting, hoping that the G. A. R. would meet at Denver, Col.; but when it decided to meet at Cleveland, and we received the invitation of the Pomological Society, we felt that we ought not to miss such a splendid chance to enlighten some of them on the relation of bees to horticulture, and, by meeting at Buffalo, the York State and Canadian bee-keepers would be within easy reach of the place of meeting; so we at once fixed on Buffalo as the most desirable place.

It has been decided not to have any papers or essays, but to rely wholly on the question-box to bring out the best and most important matters for discussion, so that any one not being able to be at the convention, having any question or questions he may wish to have discussed, can send them to the Secretary at any time.

The Committee has taken the liberty to request the Secretary of the Ontario Bee-keepers' Association to ask the members of that Association who may attend the meeting at Buffalo to bring their badges with them and wear them at our sessions, whether they are members of our Association or not, so that we may feel more as one, and know who our progressive neighbors are.

Information regarding place of meeting, entertainment, and railroad rates will be given as soon as decided upon. Don't be in a hurry about securing a sleeping-place during the convention. There is plenty of time, and, later on, better rates can be secured; but if you are in a hurry, write to the Young Men's Christian Association, and don't be bled by "sharks."

A. B. MASON, Sec., Sta. B. Toledo, O.



He shall be like a tree planted by the rivers of water, that bringeth forth its fruit in its season; its leaf also shall not wither.—PSALM 1:3.

Wash ye, make you clean.—ISAIAH 1:16.

I do not know but some of the friends will object to the way in which I use or apply the first of my texts above. In fact, I do not know but they will object in the same way to the second one also—some of my ministerial friends especially. I can imagine the pleasant smile I see on their faces when they see this. God knows I have a most abundant reason for feeling that the clergy of all denominations who read these Home Papers are my firm stanch friends, even if they do not always agree with my “theology.” It gladdens my heart when I get their kind letters, and it gladdens my heart still more when it is my privilege, as it sometimes is in traveling, to take them by the hand and see the cordial smile on their faces as they bid me Godspeed in defending our homes. Now for my use of the text, the first one.

People who till the soil and practice thorough underdrainage have been for years annoyed by the roots of certain plants and trees going down into the tile-drains; and many of you may have noticed that at times these tile-drains get filled up and clogged with fibrous roots, and at other times they never go into the tiles at all. Somebody finally suggested that whenever tiles carry running water that goes through all summer long, the roots of a great variety of plants will get into these tiles by some hook or crook. They are after the water that can not be found anywhere else. It is not only astonishing but it is laughable to see how the rootlets will crawl all over and around the tiles, and fairly hunt for cracks or crevices. Sometimes they will find a little hole left in burning the tile. A little root will get through this opening, and then spread out two or three feet each way, filling the tile with a broomy mass of fine rootlets until it is clogged entirely. This happens oftenest when the tiles are made use of to carry away the water from a natural spring or seeping-place, say in a side-hill. In this case the tiles would carry some water all summer, and the greedy, thirsty roots have found it out. One of the remedies suggested is to get vitrified sewer-pipe with collars, filling the joints with Portland cement. But if the job is not thoroughly done, the roots will actually squeeze through this cement and break it away. Willows especially are given to this kind of work.

During my childhood days there was a pretty little spring where I often used to drink, at the foot of a hill. Somebody stuck a willow twig in the damp mud close by this spring. Forty years later this twig was a tree three feet in diameter, and the spring had disappeared. The willow-tree had sent its roots all around the sources of that spring, and finally

utilized the moisture to such an extent that it made dry ground around where there used to be a running spring and a piece of wet bog.

We are often told that sunflowers ward off or prevent malaria. At first I thought that was on a piece with other silly superstitions; but a government bulletin has recently given notice that, if you plant a number of sunflowers where the slop-drain from the kitchen empties, these sunflowers, when they get a going, will take up every particle of the dish-water and other slops, and in this way ward off malaria. The sunflower makes its rankest growth during hot weather, when bad smells are likely to emanate where the slop-drain empties. By the way, I have all my life enjoyed utilizing things that bother us. You know how much trouble hens make in scratching just now when we are making garden. I believe it is the neighbors' hens that make the most trouble. Well, when somebody spoke of utilizing hen power in fining up manure I thought it was a big invention, or perhaps we might say suggestion. Some years ago one of the bee-friends in commenting on the many inventions there were to get rid of the moth-worm in hives, remarked that he on the contrary was engaged in *growing* moth-worms for profit. He said if anybody knew how to get a great stock of them on short notice he would like to find it out. After we all had racked our brains to know what earthly use moth-worms could be to anybody, he said he grew them to supply fishermen; that certain fish would bite quicker at a big fat moth-worm than at any other bait. Now, on the same plan we are going to work to coax by every means in our power the pesky roots and rootlets from all kinds of plants and trees to go down into the tile. The purpose of this is sanitary drainage.

That reminds me just now that I forgot to tell you in the outset this Home Paper is devoted, at least mainly, to *sanitary drainage*, or, perhaps we had better say, utilizing the sewage that must be disposed of in some way around every home. The Department at Washington has already published two bulletins in regard to this matter, and I believe they have recommended throwing the slops out on the garden or lawn, or pouring them around the trees, first in one place and then another. But this is a lot of work for the dear little wife, or, if you choose, the dear *big* wife. (If she is large and heavy it may be still *harder* for her to get around lively with the slops.) Yes, I know some of you will rather smile (may be with a little sarcasm) because I spoke about having a *wife* do these things, and suggest it is the hired *girl's* business. My good friend, do you know of any hired girl who would carry out slops and put them first in one place and then another, or pour them around the growing trees and plants that need it? If you know of such a one, she could get a hundred situations right here in Medina, this very day. But aside from this, if we love our neighbors as ourselves we should be almost as anxious (?) to save the hired girl's steps and strength as to husband the energies of the mother of the

home. If we love the dear Savior we shall be working in the interests of *all* womankind.

Well, these government bulletins, while admitting the value of the slops, rather discourage underground slop-drains and cess-pools. They do speak about tiles laid so near the surface that vegetation can absorb the fermenting liquids; but they touch on the subject only lightly. The reason why we may feel pretty sure various plants and trees will find their way into the slop drain is because there is a certain amount of moisture going though said drains every day in the year. When the roots and rootlets discover it is a daily program, they are like a lot of chickens that have become accustomed to get feed and drink at a certain spot every day—they will very soon be on hand promptly, *without fail*, and ready for business. Some years ago a friend sent us a slip of willow that he said was an excellent honey-plant. We stuck it in the ground in a damp place in the lower part of the apiary. Well, it happened to be right near the roadway to the barn; and to keep this roadway dry a tile was run through under the road. Before the willow had been there many seasons this tile would not work. It was a mass of willow roots from one end to the other. We took them out and put in larger tile, and in two years this larger tile was utilized by the willow in the same way; and during the past winter I saw a pond of water in that old spot, and I suppose we shall have another job of getting those roots out of the way. It is like the text—a tree planted by running water; and, true enough, its leaf has not withered, even in a dry time. The willow-tree has made a most astonishing growth, and is going to crowd out evergreens, fruit-trees, and every thing else, if we do not take it away.*

In my earlier experiments in sanitary drainage I had a four-inch tile leading from an outdoor slop-basin down into the orchard. In a few years it would clog up with soapsuds and other stuff. By digging a pit at the lower end, however, the soapy jellylike mass would begin to move slowly, and finally run out like sausage from a machine (I beg pardon for the illustration), and after considerable coaxing we would get the tiles clear so they could be washed out. Now, a stoppage is likely to happen to almost any slop-drain or to any outlet to the water-closet; and to guard against such stoppages it occurred to me to have the tiles gradually increase in size as they recede from the house. So I bought a lot of tiles of all sizes. Through the wall of the basement of the house, and for perhaps 12 or 15 feet, we used four-inch glazed sewer-pipe, with the ends carefully cemented. This four-inch pipe was then introduced into some six-inch tiles. We ran these tiles 15 or 20 feet, then put in a size still larger, and so on till we got up to

twelve-inch tiles, keeping them just enough under ground so the plow would not strike where we go through the orchard. I wanted some hard-burned tiles that would not be easily crushed by the weight of the horses, and so I went to the tile-factory and bought a lot of culls. They were warped and twisted by being burned too hard. Now, these warped and twisted tiles could not be fitted together so as to make a tight joint; and, in fact, I did not want a tight joint. I wanted to give every chance possible for roots to get into this slop-drain. Just a little east from the house we have a Downing ever-bearing mulberry. This tree loves water almost as well as the willow.

A little further we have a choice early apple-tree. The apparatus was arranged with the view of having these trees send their roots into the drain as much as possible. In fact, I wanted to coax all the roots into this very drain. You may ask what is to be done when the tiles are choked up with roots. Well, I decided if it did not choke up too quickly I would either clear them out or buy some more tiles and put them alongside of the filled ones, whichever was the cheapest. The apparatus has been running now for about ten years without any stoppage or any supervision whatever. The fruit-trees are making wonderful growth, and bearing grand crops of fruit. A similar arrangement was constructed for Ernest's home, the tiles being carried down through our vegetable-garden. As there were no means for carrying it as far as at my home, after it had been running four or five years he was obliged to carry it a little further, and increase the size of the tiles to 18 inches. We both use water-closets. This necessitates a large quantity of water to keep every thing well flushed. The apparatus at my own home goes down through the orchard between two rows of apple-trees, and is perhaps 300 feet in length all together. After the size of the tiles had been increased to 12 inches we used twelve-inch tiles for about 25 feet. After that we laid only a four-inch drain to carry off the comparatively clear water. This four-inch drain crosses at right angles some 2½-inch drain-tiles laid through the orchard in an opposite direction. Thus you see the liquid part of the slop is gradually spread over an orchard occupying something like an acre.

This method of disposing of sewage will, of course, work best on sandy soils. With an open porous sandy soil, fewer tiles may be used, and a much cheaper arrangement. You can tell, by experimenting, the length required to get rid of all the slops. Our own ground is stiff hard clay. Of course, these slops must be carried off so far from the well that no seepage or drainage can by any possibility reach the well. We use and prefer a cistern. A government bulletin directs that the sewage should be run off on the opposite side of the dwelling from the well; that the well should be on higher ground; that the sewage should go at least 100 feet, with a good fall before it is dropped where it could by any means accumulate and ferment. I feel sure the owner of any home could manage this matter so as to utilize the fertilizing qualities of the slops,

*In the government bulletin I have already referred to, it says that low wet ground, or places where water is liable to stand and make the vicinity of the home unwholesome, may often be made dry by planting suitable trees. A good-sized maple shade-tree, for instance, planted in a wet seepy spot, will make dry ground of a place that had been, before the tree was planted, even swampy.

and at the same time save a great amount of labor in spreading it around.

If you wish to use a water-closet you will have to have some sort of reservoir, either in your attic or up high enough to give a head—that is, if your town or city does not have waterworks. The people who sell water-closet fixtures will give instructions in regard to ventilation; but I think I had better say right here that every system of sewage, such as I have described, should have traps inside of the building so that sewer-gas can never come up through the tiles. Besides this, to make it doubly sure, right where the sewer-pipe comes through the cellar wall to get outdoors under ground, there should be a standpipe running up above the roof of the house. An iron pipe two or three inches in diameter is perhaps the safest thing for this purpose. Old boiler-flues screwed together make a cheap and substantial air-pipe or vent. This, of course, passes into the open air above the building; and should there ever be fermentation anywhere in the sewage-tiles, the product goes up this pipe, and is scattered to the winds above the roof of the house.*

Now, do not object to this thing on account of expense. It pays to save the strength of the women-folks. I hardly need tell many of you what hired girls cost—not only in money, but in health, comfort, and happiness. Then heavy doctor-bills might be avoided by a little money spent in sanitary arrangements. Typhoid fevers are now *almost every time* traced directly to heedlessness in the way of sanitary arrangements. Ask your family physician about it. Read the papers, and see what has been done in the cities where yellow fever formerly raged season after season. Even the bubonic plague is now yielding to energetic and heroic treatment by our most intelligent physicians. We are certainly making great headway in the line of *prevention*, even if we are not accomplishing all we should like, in the way of *cure*.

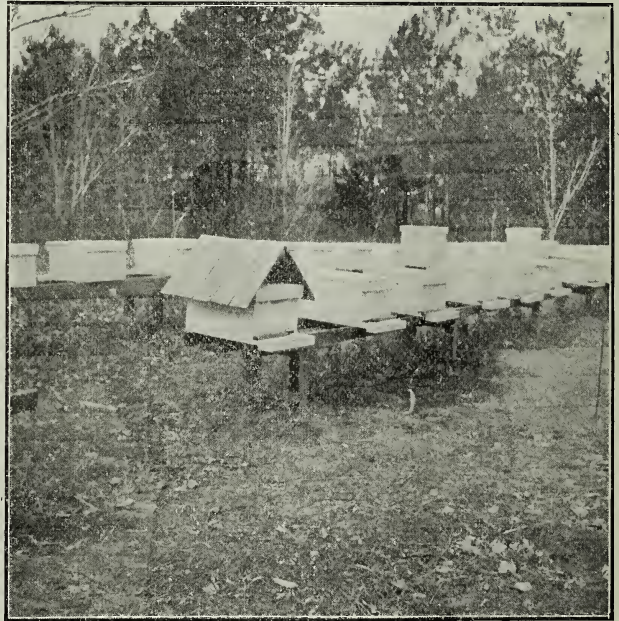
Perhaps this Home Paper has not touched very much on spiritual matters; and, in fact, many people may think both of my texts were intended for spiritual instruction only. Granting this to be true, I am sure the great Father above delights in teaching us to protect ourselves from disease, and in keeping not only ourselves but our homes *clean* in every sense of the word.

* Mrs. Root says, since the above was written, that this arrangement is worth more than you can tell as a convenient place to pour down slops, dishwater,



MARCHANT'S PLAN OF ARRANGING HIVES, APIARY, ETC.

On page 197 of GLEANINGS for March 1st I gave a brief description of the apiary I have pictured here. Friend Marchant has movable stands for his hives, constructed as shown in Nos. 1 and 2. Two rows of stands make a double row of hives with a space between the two rows so the operator can pass back and forth without getting in front of the hives or interfering with the flight of the bees. Now, instead of having these two rows in a long string, he has them arranged in the form of a hollow square, so that half an acre of ground will accommodate, say, 200 hives, and not have them crowded either.



NO. 1.—A FEW HIVES OF MARCHANT'S APIARY AT MARCHANT'S LANDING, ON THE APALACHICOLA RIVER.

In No. 2 you will notice a number, 190, close by a hive in the center of the picture. These numbers are attached to the *stand* and not to the hive. If the hive is moved away, and another one put in its place, you do not have to remember to pull off the numbers and change them. Another thing, you will notice

etc., that you would not want to put into the kitchen sink. In all the years we have used it, no smell of any kind has ever been perceptible, even to the most critical nostril; and different people have been incredulous until they examined the whole apparatus most thoroughly, and yet it is within only a few yards of the kitchen and kitchen stove.

two boards or planks between the rows that form the stand. These planks are a little lower down. Now, the popular way of feeding in the South is to pour the syrup or honey on the bottom-board; but if the hive is level the feed will run out of the entrance and incite robbing. This manner of feeding is, of course, done at dusk, just after the bees have quit flying. In this manner every thing is licked up clean before morning, so there is no tendency to rob. Of course, the bottom-boards are permanent. Well, now, to keep the feed from running out at the front, the hive is pulled forward just enough to let the back end sink down and rest on the plank; and a hive may remain in this position as long as you are feeding unless you have considerable rain. If it commences raining very much you want to go around, lift up the back end of each hive, and slide it back.

Now, there is another advantage in these movable stands for hives such as I have de-

we have exceedingly high winds. If I remember correctly, friend Marchant says that, during the heat of the summer, he will put up posts and make a roof of boards to shade the hives and the operator. But this roof will be removable so it can be taken off and piled away during another fall, winter, and spring; for during winter, he says, he must have all the sunshine on the hives that can be had, and the same until the sun gets so hot that the shade-boards are an advantage.

Well, my two pictures are pretty good for a green hand with the kodak. Don't you think so? But lest you should not notice it, let me direct your attention to No. 1. It is a little like the puzzle pictures we see in some of the newspapers. If you look sharp, perhaps you will see two girls in the background. They do not belong to the bee-keeper, however. Mr. Marchant wanted to take me up to his out-apiary, a mile or more up the river. The obliging captain of a little steamer very kindly carried us up there. After we got back, his two little girls wanted to know if I could take their pictures. They stood up in front of Mr. Marchant's house. Well, I took their pictures, but forgot to turn the film. I insist that I did *not* forget — that I turned the film *every time*; but Ernest says that the *kodak*, like *figures*, never tells lies; and while the poor girls did not get a picture they are (after all) there just back of the hives. I wrote them the best apology I knew how to make; and next time I will try to turn off the film after I take a snap shot at the hives, especially when some good-looking little girls want their pictures taken.



MARCHANT'S STANDS FOR HIVES, AND METHOD OF SHADING THE HIVES.

scribed. In many parts of Florida, ants are very troublesome. Some of the larger kind will drive out and destroy a colony of bees unless they have protection. Just put each leg of the hive-stand in a dish containing water, with a little coal oil on the surface, and the ants will be helpless so far as meddling with the bees is concerned.

Last, but not least, these kodak views were taken to illustrate Marchant's method of shading. The shade-board is made of shingles, as you will notice, and their form is such that they hold their place on the hives unless

ruary. There was a very cool north wind, so the bees could not fly very much; but the hives were "chockful" of honey, and he said he would have been extracting had not the weather been so cold. This Florida pennyroyal grows more or less through the woods in many parts of Florida, but there is not such a quantity of it anywhere else that I know of as right around Mr. Poppleton's. The honey is not as light in color as some, but it is very fair, and it has a peculiar enticing flavor. We have a barrel of it on the way to Medina. When it comes I will tell you more

At Stuart, Dade Co., Fla., I found our wide-awake veteran bee-keeper, O. O. Poppleton, as busy as usual, and actually getting honey from the Florida pennyroyal, although I rather think there is no other bee-keeper in Florida who secured any honey in the month of Feb-

about it. By the way, when I write of these honey-plants, a good many people will be sure to want seed; and this may all be very well for somebody who wants to make a collection of plants that yield honey. But it rarely if ever is the case that it will pay to plant any thing for just the honey alone. Friend Poppleton visits his out-apiaries with a gasoline-launch large enough to carry a dozen or more people; and, in fact, he uses it in bringing his bees from one locality to another, and it will carry successfully a considerable apiary.

I made a brief but pleasant call at Mr. J. E. Fultz', and another one where there was a very extensive pineapple plantation under a shed. Friend Poppleton and his neighbors claim that their locality is about the best point in Florida for growing pineapples, and also that the good ground is pretty well appropriated or held by somebody, with the expectation of getting big prices for it. I have told you something about Florida land that could be bought for 50 cts. an acre; but right near Mr. Poppleton's there is desirable property for growing pineapples, which can not be bought for \$100 an acre, even in its wild state. Owing to its proximity to the water, there is little danger here from killing frosts, even if pineapples are right out in the open air. But the sheds give better results, and are quite a protection during severe weather.

I succeeded in getting kodak views so perfect that they explain the construction of the sheds almost without any thing further. See cut adjoining.

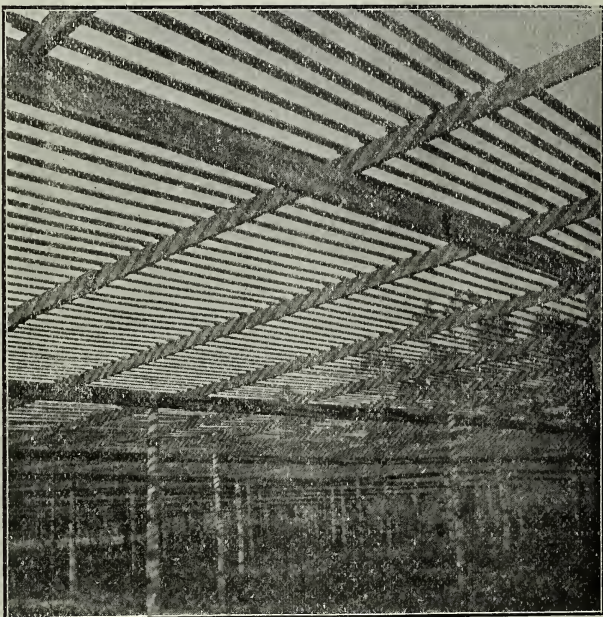
The posts are made of some durable timber found in the woods, of such a length as to go three feet or more into the ground, and to keep the roof overhead about 8 feet from the surface. The slats are about 3 inches broad, usually of 1-inch lumber. The spaces between them are usually 3 inches, sometimes 4.

The shed pictured was constructed for a relative of Mr. Poppleton. I believe it was built under Mr. P.'s own supervision.

The second picture shows a view after the plants were pretty nearly full-sized. There are walks of different widths separating the plants into beds of perhaps 10 or 12 feet in width. Real healthy plants have sometimes spines or sharp-pointed needle-like leaves nearly as high as your head. In fact, it is somewhat dangerous business to get around among them. Friend Poppleton said there were a few ripe fruits that ought to be gathered. He said he would walk down one side of the bed and I down the other. He told

me to look out for apples that had commenced to turn. Now, I pride myself on being remarkable about keen vision, especially when it comes to picking up potatoes. Some of the boys claimed I could see a potato that was entirely under the dirt. Well, I felt sure I could find every pineapple fit to pick; but when my good friend pointed out a beautiful specimen I did not see, not over a yard from where I passed along the path, I began to think I was not so much smarter than common people after all.

A pineapple in bloom is a beautiful thing. Why, even if it did not bear fruit at all, I should not be surprised if the plant were grown in greenhouses just for the blossoms alone. Well, at the same time the plant is producing fruit, little plants something like suckers are growing up around the parent plant; and where the variety is valuable and high-priced, the little plants frequently bring as much money as the ripe fruit. It is no uncommon thing to have pineapples that bring



A NEW PINEAPPLE SHED, SHOWING CONSTRUCTION, AND LITTLE PLANTS JUST STARTING.

75 cents each at wholesale. Dyer Brothers, who are near neighbors to Mr. Poppleton, have sold during the past two years \$5500 worth of pineapples from about 12 acres. If I am correctly informed, a large part of the 12 acres is not yet in bearing. The pineapple grower gets some fruit in about 18 months after beginning operations, but not much before the plants are two years old. The fertilizer alone for an acre of pineapples costs about \$50 a year.

Right near his honey-house Mr. Poppleton has a little grape-fruit tree about as high as

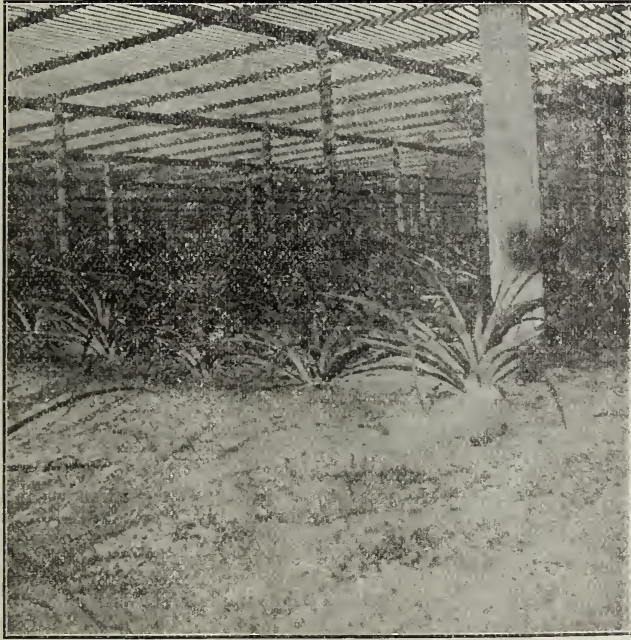
my head, that had ten monstrous grape-fruits. Well, they were not really *hanging* on the tree, because they were so heavy that most of them rested on the ground. I took a kodak view of it; but Ernest pronounced it "no good." The locality round about Stuart will likely very soon be noted for its oranges and grape-fruits as well as for its pineapples.

Six years ago West Palm Beach was the terminus of the East Shore Railway; but the road now runs away down to Biscayne Bay, and on to Miami. I stopped one day at West Palm Beach to visit one of our Medina Co. boys, or one who used to be years ago, Mr. J. N. Parker, and also to look over the Royal Poinciana Hotel. Friend Parker is in the truck business. He grows pineapples to some extent, but does not give as much attention to it as they do in some other localities. He had some of the handsomest Irish potatoes I ever saw anywhere. At his place, for the first time, I ate guavas right from the bushes. He said it was a little early for nice ones. I spent

as large as peaches, but they look more like a potato. I found them for sale, however, on fruit-stands, and after a little practice I learned to like them tolerably well. They are rather sweet, and remind me of the mandrakes of my childhood. Once when I was a boy I got very sick by eating too many mandrakes, and therefore any thing that reminds me of this occurrence brings up recollections not exactly pleasant. If I am correct, the sapodilla is sometimes called the custard apple.

The morning I visited the great hotel I was told that 1600 people took breakfast, and that their breakfast costs the guests, on an average, \$1.00 each. It took about 400 waiters to take care of the 1600 guests. So this one hotel has a population, if that is the proper way to speak of a hotel, equal to a town of 2000. I did not get breakfast there myself, nor dinner. The dinner costs more than a dollar if I am correctly informed. But I very much doubt if anybody enjoyed his dinner more than I did mine. Shall I tell you what it was? I went

to a fruit-stand and bought a nice ripe pineapple for 15 cents. Then I went to a restaurant and asked for some bread and butter. For a nickel I got a great plateful of bread and plenty of nice butter. The pineapple was both food and drink, and so I did not have any tea or coffee, and certainly did not *want* any. When the proprietor said five cents paid for the bread and butter I gave him another nickel for clearing up the remnants of my pineapple. Well, I had several meals of just pineapple and bread and butter; and I have a sort of notion in my head that such a diet would agree with me to a dot, three times a day, the year round; and I have been planning to take, some time, a vacation, and live on pineapples and bread and butter for several days, and prove to the world that such a diet is ample. Oh dear me! how many things there are I



ANOTHER VIEW, SHOWING LARGER PLANTS.

half a day very pleasantly, and I think profitably, in looking over the wonderful tropical gardens belonging to the Royal Poinciana. Here we find almost every tropical plant known in any part of the world, and, better still, every plant, from the smallest flower to the largest tree towering away up toward the sky, and each plant, tree, or bush, is plainly labeled with the common name, and also the Latin name. In fact, it is quite a school to go over the grounds and learn by practice to call by name all these exotics by sight. Of course, you can not pick the fruit. I was greatly interested in the sapodilla-tree. The fruits are

should like to try if this busy world's cares did not stand in the way!

There is quite a pretty zoological garden connected with the Royal Poinciana; there is also an aquarial garden; but it is not taken care of as it might be, notwithstanding somebody is constantly on hand to take the 25 cts. one has to pay to look through it.

During the past few years, the Royal Poinciana has been enlarged by a sort of annex hotel that they call the Breakers. I believe the expense of stopping at the Breakers is a little less. It is not worth while, however, to find fault with high prices while everybody,

high or low, rich or poor, is permitted to ramble at will all over the beautiful premises, without a cent of expense.

Just now another magnificent structure, employing a small army of mechanics and laborers, is in process of construction. They were just laying the foundation for this building at the time of my visit. I was told it was to be the palatial residence for Mr. Flagler, the owner of the East Coast Railway. He is the owner, also, of half a dozen or more of these palatial hotels that accommodate people enough during the height of the season to make a fair-sized city.



DOES IT PAY TO HAVE SOME APPLE-TREES? THE RAWLES GENET.

After planting an orchard of 100 trees we waited almost ten years before we had apples of any account; but now our orchard begins to do us some good. Last year we had two trees that gave us a heaping ten bushels each. That is not very much; but these apples now, toward the middle of April, are just as plump and crisp as if they had just come from the tree—yes, a good deal more so, because late in the fall, when picked, they were too hard to be fit for any thing. They are the variety called Rawles Genet. When the trees first began to bear I thought so little of them I wondered why anybody should want such a miserable, hard, worthless apple. The value of this apple, however, is something like that of the Kieffer pear. The trees are loaded down every season ("Never-fail" is another name for it), and the apple is a better keeper than any thing else I know of. But I made a big mistake last season that I did not pick off more than half the apples. Had I sorted out the gnarly ones, and small imperfect ones, where there were too many on the limbs, I think I should have more bushels, and all big nice smooth apples. We have got to come to hand-picking and thinning if we want to produce the finest high-priced fruit. Well, even as it is, these two trees gave us pretty nearly \$10.00 worth of apples each. In fact, the apples would bring more than a dollar just now, and there is not a bit of trouble in keeping them till May—at least, we have never had any trouble. Another thing, will it pay to plant fruit-trees when you are over 60 years old? I got to thinking of this because I have just ordered a lot of trees from a nursery, to be shipped to our Michigan ranch.

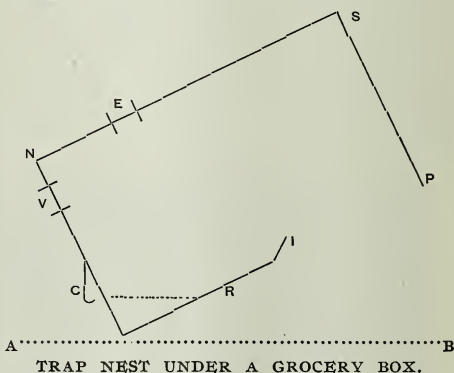
MY NEW TRAP NEST.

On page 160 one of the friends, you may remember, asked me to "walk around the stairway" and study up a cheap and efficient trap nest. I have, therefore, given the matter some thought, and have produced a very cheap one, and one that works so nicely I feel like shout-

ing "Eureka!" as did the philosopher of olden times. Perhaps, however, I had better hold back my enthusiasm a little until I see how it works in the hands of others, and how it stands the keen scrutiny of *bona-fide* poultry-men.

In the first place, you want to get a light box at the store or grocery. For small-sized hens an oblong box a foot wide, a foot deep, and 2 feet long, will do very well. But for medium fowls it had better be 13 inches wide and deep, inside measure, and 2 feet long. For some of the large breeds, 14 inches wide and 13 deep will be better.

The diagram below will make it plain, I think.



Let the dotted line AB represent the ground or floor of the poultry-house. Now let CPSN represent our drygoods box. Turn it upside down and cut off the lower corner down through on the line CR. Now fit a board in this opening so as to take the place of this dotted line CR. Now drop your box down on to this cut-away corner, and it will stay in position providing you put weight enough on CR to hold it down flat. For illustration, suppose we put a flatiron or a suitable-sized stone right in on the line CR. In this position it would be just the thing for a hen's nest or just such a nest as any hen likes. Suppose she is hunting for a nest, and walks along the line AB until she puts her head under at P. Of course, we have to make a bottom for the nest, with a board nailed in so as to have a bottom, IR, joining the dotted line CR. This bottom of the nest need not be tight. In fact, it is better to have cracks so the litter can sift out. Put in some leaves, cut straw, or excelsior; then a nest-egg, or two, if you choose, to get her started. She walks up under P, looks over the strip of board at I, and steps up on it to get into the nest. As soon as she steps on I, the box tilts and shuts her in. In the diagram, I is shown higher up from the ground than it really is; because, when that corner is sawn off, the dotted line CR rests on the dotted line AB.

Well, that stone or flatiron that I told you to put on the bottom CR is rather in the way, so we will have some iron rods for a weight, and we slide them into a sort of shelf shown at C. This shelf is made of a strip of tin

or galvanized iron rolled up like the cut at C, tacked on to the back end of our box. These rods are for weights so the box will just tip up enough to let the hen get into the nest. You can get the rods at any old iron heap. Have a blacksmith cut them off a foot or 14 inches in length. I would use these instead of one weight, because with a hen sitting you need more "ballast" than when there is only an egg or two, or three eggs, laid in the trap nest every day. You need not say it will not work, for it has been working to perfection for the past two weeks.

E and V are openings large enough for you to put your hand in to get the eggs every night; for I have found by experience that it is rather tiresome reaching over the front board I to get the eggs just above R. Whenever a hen is on the nest, the box tips down and is closed. No other hen can get in until this one gets off. When a sitting hen is off, some other hen might get in and lay an egg, it is true. But that is the case with any trap nest. The only remedy is to have the sitting hen let loose in a little yard or pen for her exclusive use. For my part, however, I like to see a sitting hen get off and have a good run, and have exercise as well as food and drink.

Some of you may say right here, "But, hold on, Bro. Root; this is not a trap nest at all;" to which I own up; but it is just such a nest as Fred Gundy describes, or perhaps, rather, it accomplishes the same result, and his nest costs a dollar to "know how." Besides, you can make a trap nest of this kind in almost no time.

You will notice the hook-shaped shelf near the letter C has an opening between the lower edge and the box. Select a single iron rod, just heavy enough to bring up the box nicely when the hen is off. Now bend the lower edge of the tin shelf so this rod will drop down on the ground as soon as the weight of the hen tilts the box down in the closed position. In this case the hen stays under the box until her owner picks the rod off from the ground and lays it on the shelf again. You might have a latch at P to snap on the box and catch it when it shuts down. But with this you would need to fit it on a permanent floor. With my arrangement you can pick the box up and move it wherever you like, and set it on some smooth ground or on the floor. In order to avoid having a heavy weight to raise the box up, the box should be of very light stuff— $\frac{1}{2}$ -inch sides, with all the rest $\frac{1}{4}$ or $\frac{3}{8}$, will do very well. In fact, a box made of veneer is as good as any thing. If you make a box on purpose you might round off or bevel the corners SN. Or instead of a box you could use a light basket. But a basket usually costs more than a box. I found an oblong bushel basket that makes a splendid trap nest.

Now, when you use a basket that is hardly deep enough, or if the grocery-box you get hold of is hardly deep enough, there is another way that will enable you to use your shallow box without cutting it at all, and this same arrangement is used for the basket. To do this, get two triangular pieces of wood like DBC in the diagram above.

Place them the right distance apart, then nail thin boards between the two, at C, B, and D, making the bottom of the nest. The boards at C, B, and D are lapped over the two side boards. The piece at I will need to be a little heavier, so you can nail through D, B, and C into the end of I. Now this arrangement is to be nailed secure to the open side of your box. Tip the box over, and you have your trap nest as first described. If you use a basket, this arrangement in Fig. 2 is to be fastened to the sides of the basket. Tip the basket over, and your trap nest is all complete like broken line over Fig. 2.

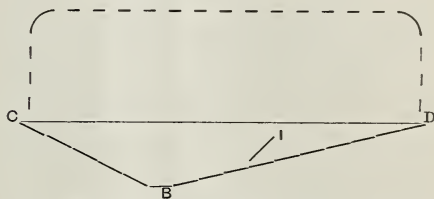


FIG. 2.—TRAP NEST WITH BASKET INSTEAD OF BOX FOR TOP.

In Fig. 2 the diagram represents the angle at B rather too sharp. It wants to be just right so that, when the nest rests on the base CB, D will be just high enough for the hen to stoop down and get under. You may say a hen will not go into such a place. That is because you do not know hens and do not know how to manage them. They are the easiest animals to teach any sort of trick, in the whole wide world, if you just take them right. When your nest is new, prop it up with bricks so that the hen can go under the edge of the box without ducking down at all. After she has got on the nest and laid one egg, she will do it next day sure. Then drop the box down a little, and she will be willing to stoop a little lower each time. Make the angle at B so that, when the nest is set ready for the hen, it will be just as low as she can get under D without too much squeezing. She will like it all the better if it is a little bit difficult to get into. The objection to having the box raised up too high is that changing from one base to the other makes too much "jostling" for the eggs. When you get this angle at B just right, it does not disturb the eggs at all when the hen steps on top of the threshold at I. Somebody will be sure to say a spring will be better than the weight I have arranged. Yes, it is a very easy matter to have a coiled spring of just the right tension from A to N, Fig. 1. But you can not move the nest around where you wish, and you have got to have a floor board under it at AB. If you do not want to bother with a coiled spring, just take a springy hickory stick and push it in the ground along the line CN; but I prefer the weight.

If you prefer a spring instead of a weight, in order to make it trap the hen, you must arrange so the spring will slip off or let go when she steps on the edge of the nest. Attach the basket to the nest proper with four pieces of annealed wire.



At the present writing there are a lot of new methods of treating disease, and people are sending their money and telling of the wonderful cures performed. Yes, you will meet somebody at every turn who will say something like this: "Well, I was just as skeptical as you are or anybody could be; but when I saw what was done right under my own eyes, I had to give up." And so it goes. A woman said a few days ago, in regard to so-called Christian Science, that, just as soon as she wrote to a certain great doctor, and described her troubles, just the minute he got her letter and understood the matter, she was well at once, and he was hundreds of miles away.*

Well, these wonderful cures do tell us something—in fact, they *ought* to tell us something—more especially the fact that all kinds of doctors and *doctrines* seem to cure just the same. It reminds me of a clerk in a drug-store who said he had noticed that, no matter what sort of patent medicine the ailing customer purchased, they all got better. Now, the wonderful lesson these facts ought to teach us (and I admit there are facts all around us), is that our troubles are either imaginary or else they are in some strange way so dependent on the will or the mind that a certain kind of shaking up, call it "faith" if you will, either in the doctor or in the medicine, produces wonderful results. There is something exceedingly fascinating in this matter. I do not understand it myself; and I fear I, too, have sometimes been carried away by these new treatments, or whatever else you may call it. May God help us in our efforts to sift truth out of so much fiction and superstition.

MORE ABOUT TOMALES.

Last week Bro. Root took a look over the Southern country, and entertained us with a very readable article, but he gets terribly mixed up when he had Indians making his hot tomares. He must have meant Mexicans. An Indian knows as little about making tomares as a boy does about bee-keeping. The Mexican has the exclusive right to the tomarle manufacture. No one is a success at the tomares and chillikin carne except them.

Graham, Tex., Mar. 21.

R. C. McPHAIL.

[Friend M., I stand corrected, and thank you for the correction; but, notwithstanding, the Indians certainly do pound up corn. In fact, we find these old stone basins scattered all over the deserts of Arizona, and this pounded corn is then made into a special cake. I can not remember the names, but you doubtless know all about it. Well, my impression was that the tomarle was the same thing, only a little more elaborate, with chicken meat, etc.—A. I. R.]

*I should like to give the names of some of the new methods of treatment of disease, but I am afraid I should hurt the feelings of some of my near and dear friends. The new doctors are certainly getting *piles of money*, but I really fear the patients are *not* getting any just equivalent.

Much has been said, and is being said continually, of the advantage of feeding poultry green bone cut with the various bone-cutters on the market; but I had not thought of it before, that manure from bone-fed poultry has a special value over other poultry manure. In commenting on this matter the *Ohio Farmer* has the following:

Here is a pointer for poultrymen. The manure from such feeding is worth twice the cost of the bone at the meat-markets, and is worth all it costs as an egg-producer in addition, and the soft ration is balanced by the addition of potash.

Books for Bee-keepers and Others.

Any of these books on which postage is not given will be forwarded by mail postpaid, on receipt of price.

In buying books, as every thing else, we are liable to disappointment if we make a purchase without seeing the article. Admitting that the book-seller could read all the books he offers, as he has them for sale, it were hardly to be expected he would be the one to mention all the faults, as well as good things about a book. We very much desire that those who favor us with their patronage shall not be disappointed and therefore we are going to try to prevent it by mentioning all the faults, so far as we can, that the purchaser may know what he is getting. In the following list, books that we approve we have marked with a *; those we especially approve, **; those that are not up to times, †; books that contain but little matter for the price, large type, and much space between the lines, ‡; foreign, §. The bee-books are all good.

As many of the bee-books are sent with other goods by freight or express, incurring no postage, we give prices separately. You will notice that you can judge of the size of the books very well by the amount required for postage on each.

BIBLES, HYMN-BOOKS, AND OTHER GOOD BOOKS.	
Postage.]	[Price without postage.
8 Bible, good print, neatly bound	20
10 Bunyan's Pilgrim's Progress**	40
Christian's Secret of a Happy Life,** 50c; cloth 1 00	
3 John Ploughman's Talks and Pictures, by Rev. C. H. Spurgeon*	10
1 Gospel Hymns, consolidated, Nos. 1, 2, 3, and 4, words only; cloth, 10c; paper.....	5
2 Same, board covers	20
5 Same, words and music, small type, board cov.	45
10 Same, words and music, board covers.....	75
3 New Testament in pretty flexible covers.....	05
One-third off on all Gospel Hymns mentioned above.	
5 New Testament, new version, paper covers.....	10
4 Stepping Heavenward**.....	18
5 Tobacco Manual**.....	45

This is a nice book that will be sure to be read, if left around where the boys get hold of it, and any boy who reads it will be pretty safe from the tobacco habit.

BOOKS ESPECIALLY FOR BEE-KEEPERS.

20 A B C of Bee Culture, cloth.....	1 00
Advanced Bee Culture, by W. Z. Hutchinson ..	50
3 Amateur Bee-keeper, by J. W. Rouse.....	22
14 Bees and Bee-keeping, by Frank Cheshire, England, Vol. I, §.....	2 36
21 Same, Vol. II, §.....	2 79
Same, Vols. I. and II., postpaid	5 25
10 Bees and Honey, by T. G. Newman.....	65
10 Cook's Manual, cloth.....	1 15
5 Doolittle on Queen-rearing	95
2 Dzierzon Theory.....	10
3 Foul Brood; Its Natural History and Rational Treatment	22
1 Honey as Food and Medicine	05
10 Langstroth Revised, by Chas. Dadant & Son.....	1 10
15 Quinby's New Bee-keeping.....	90
British Bee-keeper's Guide-book, by Thomas William Cowan, England §.....	40
The Honey-bee, by Thos. William Cowan.....	95
3 Merrybanks and His Neighbor, by A. I. Root.....	15
Bienenzucht und Honiggewinnung.....	50

Or "Bee Culture and the Securing of Honey," a German bee-book by J. F. Eggers, of Grand Island, Neb. Postage free.

MISCELLANEOUS HAND-BOOKS.

5 A B C of Carp Culture, by Geo. Finley	25
5 A B C of Strawberry Culture,** by T. B. Terry..	35

Probably the leading book of the world on strawberries.

- 5 | A B C of Potato Culture, Terry**.....35
This is T. B. Terry's first and most masterly work.
| Barn Plans and Out-buildings*.....1 50
| Canary birds, paper..... 50
2 | Celery for Profit, by T. Greiner**..... 25
The first really full and complete book on celery culture, at a moderate price, that we have had. It is full of pictures, and the whole thing is made so plain that a schoolboy ought to be able to grow paying crops at least without any assistance except from the book.
- 15 | Draining for Profit and Health, Warring.....1 35
10 | Fuller's Grape Culturist**.....1 15
8 | Domestic Economy, by I. H. Mayer, M. D.**... 30
This book ought to save at least the money it costs each year, in every household. It was written by a doctor, and one who has made the matter of domestic economy a life study. The regular price of the book is \$1.00, but by taking a large lot of them we are enabled to make the price only 30 cents.
- 10 | Farming for Boys*.....1 15
This is one of Joseph Harris' happiest productions, and it seems to me that it ought to make farm-life fascinating to any boy who has any sort of taste for gardening.
- | Farming with Green Manures, postpaid**..... 90
7 | Farm, Gardening, and Seed-growing**..... 90
12 | Gardening for Pleasure, Henderson*.....1 35
12 | Gardening for Profit**.....1 35
8 | Gardening for Young and Old, Harris**.....1 25
This is Joseph Harris' best and happiest effort. Although it goes over the same ground occupied by Peter Henderson, it particularly emphasizes thorough cultivation of the soil in preparing your ground; and this matter of adapting it to young people as well as old is brought out in a most happy vein. If your children have any sort of fancy for gardening it will pay you to make them a present of this book. It has 187 pages and 46 engravings.
- 3 | Grasses and Clovers, with Notes on Forage Plants..... 20
This is by Henry A. Dreer, author of the book, "Vegetables Under Glass" that has had such a large sale of late. This little book tells how six tons of grass has been grown to the acre, and gives much other valuable matter.
- 10 | Greenhouse construction, by Prof. Taft**.....1 15
This book is of recent publication, and is as full and complete in regard to the building of all glass structures as is the next book in regard to their management. Any one who builds even a small structure for plant-growing under glass will save the value of the book by reading it carefully.
- 12 | Greenhouse Management, by Prof. Taft**.....1 15
The book is a companion to Greenhouse Construction. It is clear up to the times, contains 400 pages and a great lot of beautiful half-tone engravings. A large part of it is devoted to growing vegetables under glass, especially Grand Rapids lettuce, as well as fruits and flowers. The publisher's price is \$1.50; but as we bought quite a lot of them we can make a special price as above.
- 5 | Garden and Farm Topics, Henderson**..... 60
5 | Gregory on Cabbages, paper*..... 20
5 | Gregory on Squashes, paper*..... 20
5 | Gregory on Onions, paper*..... 20
The above three books, by our friend Gregory, are all valuable. The book on squashes especially is good reading for almost anybody, whether they raise squashes or not. It strikes at the very foundation of success in almost any kind of business.
- | Handbook for Lumbermen..... 05
5 | Home Pork-making; 125 pages, illustrated..... 40
I think it will pay well for everybody who keeps a pig to have this book. It tells all about the care of the pig, with lots of pictures describing cheapens, appliances, all about butchering, the latest and most approved short cuts; all about making the pickle, barreling the meat, fixing a smoke-house (from the cheapest barrel up to the most approved arrangement); all about pig-troughs; how to keep them clean with little labor; recipes for cooking pork in every imaginable way, etc. Publisher's price is 50 cents, ours as above.
- 10 | Household Conveniences.....1 40
15 | How to Make the Garden Pay**.....1 35
2 | How to Propagate and Grow Fruit, Green*..... 15
2 | Injurious Insects, Cook..... 10
10 | Irrigation for the Farm, Garden, and Orchard* 1 10
By Stewart. This book, so far as I am informed, is almost the only work on this matter that is attracting so much interest, especially recently. Using water

from springs, brooks, or windmills to take the place of rain, during our great drouths, is the great problem before us at the present day. The book has 274 pages and 142 cuts.

- 3 | Maple Sugar and the Sugar-bush**..... 32
4 | Peabody's Webster's Dictionary..... 10
Over 30,000 words and 250 illustrations.
5 | Manures; how to Make and how to Use Them; in paper covers..... 30
6 | The same in cloth covers..... 65
| Nut Culturist, postpaid.....1 50
3 | Onions for Profit**..... 40
Fully up to the times, and includes both the old onion culture and the new method. The book is fully illustrated, and written with all the enthusiasm and interest that characterizes its author, T. Greiner. Even if one is not particularly interested in the business, almost any person who picks up Greiner's books will like to read them through.

| Our Farming, by T. B. Terry**..... 1 50
In which he tells "how we have made a run-down farm bring both profit and pleasure."
If ordered by express or freight with other goods, 10c less.

- 1 | Poultry for Pleasure and Profit**..... 10
8 | Practical Floriculture, Henderson*.....1 10
10 | Profits in Poultry*..... 75
1 | Silk and the Silkworm..... 10
10 | Small-Fruit Culturist, Fuller.....1 10
2 | Sorghum, Stock Beets, Strawberries, and Cement Floors. By Waldo F. Brown..... 08
10 | Talks on Manures*.....1 35
10 | The New Agriculture; or, the Watershed Captive (a \$1.50 book)..... 40
11 | The New Egg-Farm, Stoddard**..... 70
This is an enlarged edition of the 50-cent book published 25 or 30 years ago by H. H. Stoddard. If I could have only one poultry-book it would be the New Egg-farm. This book is of special value to me because it not only discusses most emphatically the value of exercise to poultry, but it touches on the value of exercise to all other animated nature including humanity. It is entirely different from any other poultry-book in the world, inasmuch as it discusses mechanical contrivances so that all the varied operations of a poultry-farm may be done as much as possible with the aid of machinery. The regular price is \$1.00, but by buying a quantity we are able to furnish it at price given.

- 2 | Treatise on the Horse and his Diseases..... 10
5 | Tile Drainage, by W. I. Chamberlain..... 35
Fully illustrated, containing every thing of importance clear up to the present date.

The single chapter on digging ditches, with the illustrations given by Prof. Chamberlain, should alone make the book worth what it costs, to every one who has occasion to lay ten rods or more of tile. There is as much science in digging as in doing almost any thing else; and by following the plan directed in the book, one man will often do as much as two men without this knowledge.

- 5 | Tomato Culture..... 35
In three parts. Part first.—By J. W. Day, of Crystal Springs, Miss., treats of tomato culture in the South, with some remarks by A. I. Root, adapting it to the North. Part second.—By D. Cummins, of Conneaut, O., treats of tomato culture especially for canning-factories. Part third.—By A. I. Root, treats of plant-growing for market, and high-pressure gardening in general.

- 3 | Vegetables under Glass, by H. A. Dreer**..... 20
3 | Vegetables in the Open Air*..... 20

This is a sort of companion book to the one above. Both books are most fully illustrated, and are exceedingly valuable, especially at the very low price at which they are sold. The author, H. A. Dreer, has a greenhouse of his own that covers one solid acre, and he is pretty well conversant with all the arrangements and plans for protecting stuff from the weather, and afterward handling to the best advantage when the weather will permit out of doors.

- 3 | Winter Care of Horses and Cattle..... 25
This is friend Terry's second book in regard to farm matters; but it is so intimately connected with his potato-book that it reads almost like a sequel to it. If you have only a horse or a cow, I think it will pay you to invest in a book. It has 44 pages and 4 cuts.

- 3 | Wood's Common Objects of the Microscope**.. 47
2 | What to Do and How to be Happy While doing It, by A. I. Root..... 65

The A. I. Root Co., Medina, O.



DEAL DIRECT

with the Makers.



No. 3034 Buggy. Price \$38.30 with leather quarter top.


When you buy a carriage, buggy or harness. Choose from the biggest stock and fullest assortment, and pay only the cost of making, with but one moderate profit added. Our plan of selling direct from the factory insures satisfaction—your money back if you're dissatisfied with your purchase—and enables you to **save the dealer's profit.**

Our complete illustrated catalogue, showing many styles of high grade vehicles, harness, robes, blankets and horse equipments, with detailed descriptions of each, mailed free. Write for it and learn how cheaply you can buy when the jobber's and dealer's profits are cut off.

THE COLUMBUS CARRIAGE AND HARNESS CO., Box 772, Columbus, O.

No. 240. Single Strap Buggy Harness. Price \$7.95.

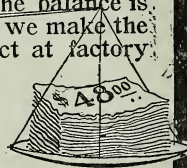
WE CAN'T STRIKE A BALANCE



on this vehicle. The quality outweighs the price. The balance is always in your favor on our line. ~~Why? Because we make the highest grade of goods and sell them to you direct at factory prices, saving you the two profits of the jobber and dealer.~~ Besides all this we send any vehicle on 10 days free trial. If not entirely satisfactory, return it at our expense.

Can you ask more? Write for catalog.

Kalamazoo Carriage and Harness Company,
Box 22, Kalamazoo, Mich.





28 Years' Experience

SELLING DIRECT.

We manufacture 178 styles of vehicles and 65 styles of harness and we sell direct to you at wholesale prices.

WE HAVE NO AGENTS

and are the largest manufacturers of vehicles and harness in the world selling to the consumer exclusively. We give you the advantage of the largest selection. You run no risk for we ship anywhere with privilege of examination, guaranteeing safe delivery. Our line consists of Rockaways or Depot Wagons, Surreys, Traps, Phaetons, Spiders, Stanhopes, Driving Wagons, Top Buggies, Open and Top Road Wagons, Spring Wagons, Delivery Wagons, Milk Wagons, Wagonettes, and all styles of harness. Send for our large illustrated catalogue—FREE.

Elkhart Carriage and Harness Manfg. Co.
W. C. PRATT, Secy. **ELKHART, INDIANA.**

The Review for 1901.

The Bee-keepers' Review for 1901 has turned over a new leaf, taken up new lines, and entered a broader field. While it continues to give methods in detail, it is striving to arouse and encourage bee-keepers; to inspire them; to awaken them; to set them to thinking, to lead them to change the uncertainties of a few bees in one locality for the certainty of many bees in several localities; to organize and co-operate; to rise up in their might, and sweep contagious diseases of bees out of this country; to work for the improvement of their stock, and to comprehend that the conditions of bee-keeping are constantly changing; and that, in order to succeed, they must keep up with the times.

Even old bee-keepers, those who have kept bees and read journals for years, are aroused to enthusiasm by the reading of the last few issues of the Review. Several have written that it seemed to them that the last two or three issues contained more practical, solid, condensed, valuable information than they had ever before found in the same number of issues.

The Review for 1901, and 12 back numbers, for only \$1.00. For \$2.00 I will send the back numbers, the Review for 1901, and a queen of the Superior Long-tongue Stock.

W. Z. HUTCHINSON, Flint, Mich.



THE DZIERZON THEORY.

This little pamphlet has been out of print for a few months, and numerous orders for it have not been supplied. We have just printed another small edition, and are now prepared to furnish it again.

A B C OF POTATO CULTURE AND A B C OF STRAW-BERRY CULTURE.

We are now at work on a new edition of both of these works, as the old ones are practically exhausted. It will be several months before both books are completed. Orders will be filled with the old edition as long as they last, unless you specify, when you order, that you want the new edition, when ready.

WINDOW GLASS ADVANCED AGAIN.

We have received notice of another advance in the price of window glass, taking effect May first, which increases the price 5 per cent over the price in effect during the past month. We have also had notice of an advance of 25 cts. per gross on Mason fruit-jars; but we make no change in our prices quoted in last issue, for the present at least. We advise those in need of jars this season to place their orders before we are obliged to advance prices. There is no prospect of any lower prices.

A MATTER OF VITAL IMPORTANCE TO WESTERN BEE-KEEPERS.

In our last issue we stated that there would be an attempt made, probably, to raise the freight rate on comb honey from its present rate of $1\frac{1}{2}$ times first class to double first class, whether the glass was exposed or not. This, according to Mr. York, of the *American Bee Journal*, "would well-nigh strangle the honey business * * * on long hauls," and he is right. This is a most serious matter for our Western bee-keepers, and while it would not affect the carload-commodity rate, yet a most vigorous protest should be sent in at once.

The next meeting of the Classification Committee will take place May 7, at the Hotel del Monte, Monterey, Cal. We suggest that comb honey producers and commission merchants of the West, at least (as it is too late to send letters) fire telegrams on or before May 7 to Chairman J. T. Ripley, of the Western Classification Committee, at Hotel del Monte, Monterey, Cal. Make the telegram read something like this:

"We protest against proposed raising of rate on comb honey."

Or word a telegram like this:

"Don't raise rate on comb honey; would ruin our business."

Or this:

"Raising rate on comb honey would handicap large industry."

These are only samples of wording that may be used, but don't adopt the exact wording; but every producer in the West should send a telegram as above directed. Do not assume that the "other fellow" will do it for you. This is bread and butter to you, and you must fight for your rights. If several hundred telegrams are fired into headquarters, *prepaid* (don't forget that, even if it does cost a dollar or more), it will cause the committee to know that bee-keepers represent a large industry, and that that industry must not, even in the interests of railroads, be handicapped in the manner proposed.

Special Notices by A. I. Root.

VEGETABLE-PLANTS—GOLDEN SELF-BLANCHING CELERY.

Owing to the press of other business we have been obliged to discontinue the vegetable-plant business, as our friends will notice; but we have now on hand a very nice lot of Golden Self-blanching celery-plants. Prices: 5 cts for 10; 40 cts. per 100; \$3.00 per 1000. If wanted by mail, add 5 cts. for 10, or 25 cts. per 100.

SEED POTATOES.

Our seconds are practically all sold out with the exception of the Early Ohio. For prices see page 357, last issue. Of the firsts, we have more or less of every thing except Maule's Commercial and Lee's Favorite. They are still in excellent condition, with scarcely a sprout started.

WHITE BLISS TRIUMPH POTATOES—REDUCED PRICES.

We have just purchased a lot of these from a bee-keeper in Wisconsin who said the people there would not buy them because they are white. Red Bliss Triumphs were all right, but they did not want white ones. It is funny what strange people there are in this world of ours. Well, these potatoes are so handsome we paid him a little more per bushel than we agreed to. They are good size, smooth, firm, not sprouted a particle, no scab, and yet we can make the same price as for the Early Ohio; viz., barrel, \$2.50; bushel, \$1.00; half bushel, 60 cts.; peck, 35 cts. I need not remind you this is at the present time, probably, the earliest potato in the world. It is the potato that is grown most successfully in the Bermudas, only they grow the red ones. The white ones have been, with great pains, grown as a sport from the red, and in most markets command a *higher* price than red potatoes.

PRACTICAL SUGGESTIONS FOR FARM BUILDINGS.

This is the title of Farmers' Bulletin No. 126, from the Department of Agriculture, Washington. You know I am specially interested in this matter just now, as I am getting ready to put up a cheap building off in the woods. This bulletin has 48 pages, and a lot of engravings and diagrams. It is so extremely practical that it commences by telling the farmer the importance of having a perfect title to his land before he begins to build. Then the place for locating the house is discussed most thoroughly; the advantages of hillside slope, proximity to timber; shade trees, the well, kitchen, garden, distance from the road, and all these things. Then they give a picture of a house that can be built for \$600, planned specially to put on an addition costing \$500 more when the farmer can better spare the means, and when his family begins to be a little larger. Every thing is figured up, not only for every piece of timber, but for nails, lath, and hinges, with a sensible discussion, not only in regard to the best and cheapest ways for building a house, but it considers precautions against fire, and how to warm the building in the best and safest way. The latter part of the book touches on barns and out-buildings, with plans and specifications. I for one feel very thankful to Uncle Samuel for this practical, sensible bulletin. You can all have it free of charge by applying to the Secretary of Agriculture, Washington, D. C.

HIGH-PRESSURE GARDENING; THE NEW RHUBARB CULTURE.

I do not know but some of the friends will complain that the department of High-pressure Gardening in this number is pretty well occupied by that trap nest. Well, I have just now in my hands a new book from the O. Judd Co. that I think is going to give high-pressure gardening a big lift. We have had the "New Onion Culture" and the "New Celery Culture," but the "New Rhubarb Culture" is going, in some respects, to beat them all, because it can be worked every day in the year, like the "hen business." See? I do not know when I have been so much taken up with a book, unless it was the New Egg-farm; but I feel sure, from what I have done with rhubarb, there is no myth about it. Whenever apples are worth a dollar a bushel or more, winter-grown rhubarb should pay big. It does not require an expensive house nor costly appliances. Any sort of cellar where it will not freeze is all right for it; and the small amount of heat necessary to force the rhubarb costs very little. The book is largely made up from reports of the work done by our experiment stations. One thing, particularly comes out sharp and clear: Before forcing rhubarb the roots must be thoroughly frozen; and the best way to do it is to plow them out in the fall in great clumps and let them freeze through and through; then bring them into the cellar and you can in a very short time get great leaf-stalks two feet long or more, and larger than any thing you ever saw outdoors. Besides that, the quality for pies or sauce is away ahead of any outdoor-grown plants. There is already a big demand in the cities for winter-forced rhubarb.

You want the book right off, so as to sow your seed and start your plants. With ground rich enough you

can. grow roots that will give a "crop of pies" next winter.

The book is nicely bound in cloth, full of illustrations, mostly photos from real work, 130 pages, and yet it is offered at the low price of 50 cts. We let the readers of GLEANINGS have it for 40 cents—5 cents more if wanted by mail. Or we will send GLEANINGS one year, and the book, postpaid, for \$1.25. Every market-gardener should have this book, for the lessons taught indirectly, in regard to forcing other crops besides rhubarb.

LEAFLETS AND PAMPHLETS FOR FREE DISTRIBUTION.

For some time back, both Ernest and myself have been having extra copies struck off, of articles appearing in GLEANINGS on subjects that there is very much inquiry about. As an illustration, so many have been asking about sweet clover, where it would grow, what it is good for, etc., that we made a collection of articles from different writers, and put them in the form of a little pamphlet. We have also similar leaflets or pamphlets on spraying fruit-trees while in bloom, on bees and fruit, bees and cider-mills, etc., besides the leaflets mentioned in our seed catalog. Below we give a list of every thing we have in stock. These have been used mainly heretofore to mail to people who made inquiry about things that had been thoroughly written up in GLEANINGS; but I have thought best to offer them free of charge to anybody who may want them. They are intended to be given free of charge only to those who subscribe for GLEANINGS; therefore our subscribers need not take the trouble to send stamps unless they choose to do so. Just tell us on a postal what leaflet or leaflets you want, and they will be mailed you. If you want to help us in this work of educating the rising generation, free of charge, you can do it by recommending and helping to extend the circulation of GLEANINGS. Below is our list:

LEAFLETS ON HONEY-PLANTS.—THE CLOVERS.

White Dutch Clover; Alfalfa, or Lucerne; Crimson, or Scarlet; Sweet, or Bokhara (the latter is quite a pamphlet).

SEEDS OF OTHER HONEY-PLANTS.

Growing Basswoods from the Seed; Japanese Buckwheat (pamphlet); Dwarf Essex Rape; Cow Peas; Soja Beans and American Coffee-berry.

LEAFLETS ON TRUCK-FARMING, ETC.

Celery-growing by Sub-irrigation near Sanford, Fla.; Directions for Using the Grand Traverse Potato-planter; Mushroom Culture; Starting Onions in the Greenhouse; Sweet Potatoes.

LEAFLETS ON BEES AND FRUIT, ETC.

Bees on Fruit; How Bees are Sometimes wrongly Blamed; American Gardening on Bees Puncturing Fruit; Bees and Grapes—Bees not Guilty; How and When to Spray; Spraying Trees when in Full Bloom; Spraying Fruit while in Bloom—Experiments at the Geneva Station; Shall We Spray Trees when in Bloom? from Green's Fruit-grower; Agency of Bees in Fertilizing Fruit-blossoms; Bees as Fertilizers.

MISCELLANEOUS LEAFLETS AND PAMPHLETS.

Temperance and Government; Salisbury on Lean-meat Diet; California as a Honey Country; Water Cure Applied Internally as well as Externally; Child-training, by Miss Sarah W. Smith.

HONEY-LEAFLETS, ETC.

Food Value of Honey; Peddling Honey; Steam Wax Extractors and Presses; Foul Brood.

KIND WORDS FROM OUR CUSTOMERS.

We get better returns from GLEANINGS as an advertising medium than from any other journal.

Feb. 21. J. W. K. SHAW, Loreauville, La.

Through the medium of my want adv't in GLEANINGS I have secured a good position.

Feb. 17. H. J. BROWNH, Stedman, N. Y.

I purchased five hives of your agents, John Nebel & Son, last spring. I am well pleased with your goods, and will use more in future. They were the cleanest, nicest lot of hives I ever saw.

S. MAXWELL, Regina, Mo.

THE A B C AS AN INVESTMENT.

I find more useful information in regard to apiculture in the A B C than in any other bee-work, and I would not be without it, as, cut off from the outer world, as we are, with no one to consult with, it is a great help, and has saved me many a dollar.

H. H. SMYTH.

Kailua, N. Kona, Hawaii, Feb. 20.

I got my A B C in due time. I am wonderfully proud of it. It is just what I have been looking for. It is worth ten times what it is sold for, to a man who has just five stands of bees.

J. I. REID.

Peoria, Tex., Mar. 21.

AN OPINION OF GLEANINGS FROM AN OLD BEE JOURNAL EDITOR.

GLEANINGS for April came to hand this morning. You fairly outdid yourselves in this particular number. Bee-keepers who do not take GLEANINGS will find themselves far behind, by and by. You not only keep abreast of the times, but well ahead at all times.

Wenham, Mass.

H. ALLEY.

THE POST FOUNTAIN PEN.

I received the Post fountain pen all right, and I am inclined to believe it is the best fountain pen yet known. The filling of the barrel with ink, and the cleaning of the pen, all done with one syringe, with so little trouble, there is no excuse for not having the pen always ready. It is a neat pen to use. I do not get ink on my fingers while using it. I have three other fountain pens besides this one; but the Post beats them all. Accept thanks for the small cost you have made this excellent pen to me with subscription to GLEANINGS.

N. D. WEST.

Middleburgh, N. Y., Mar. 27.

THE HOME PAPERS, ETC.

I read with interest Mr. A. I. Root's papers describing his combats with the Devil in various forms, also his description of travel and gardening. I take it that Mr. Root is a gentleman of the old school, with honesty and the golden rule his principal guides—a class, by the way, that has become almost extinct in commercial and political circles in the past forty years. I trust he will be long blessed with health and strength to make his fight against the great odds by which he is confronted.

A. W. CARSON.

Joplin, Mo., Apr. 6.

THE 4X5 VS. THE 4 1/4 X 4 1/4 FOR MARKET.

I did not have very good luck with the 4x5 sections, in the regular size Langstroth hive (sections cross-wise). Bees did not fill them as satisfactorily as the old-style. The poor season, and a little bungle in management, may have helped to give poor results; but one thing I do know, that is, they all sold in preference to the old-style—in fact, before one of the old-style sections was sold, all the 4x5 were gone. I shall use nothing else when I get rid of about 2000 old-style I now have on hand.

W. H. LEWIS.

New Westminster, B. C., Mar. 20.

THE TOBACCO HABIT.

I am with you heart and soul in the fight against tobacco. We have enough of its use here so that any one can see the results of its use. Men who can not get clothes to cover their children can and will consume ten cents' worth of tobacco every day of their lives. Not only this, but many men standing high in the church are constant users of the vile stuff. It is high time that every one should be aroused to the evil and power of this deadly habit, and that all professing Christians should stand shoulder to shoulder in the endeavor to rescue those who are its victims.

East Dixfield, Me., Apr. 8.

H. L. SMITH.

A TOBACCO TESTIMONY WITH THE RIGHT RING TO IT.

Mr. Root—I enjoy your Home talks very much. They can not help doing good. I am with you on the tobacco and saloon question. Keep on in the good work. Almost every one here in Southern Illinois uses the filthy stuff excepting the women, and some of them use it, and I am sorry to say, some ministers. How can one who professes to be Christlike use the nasty stuff? When I became a Christian I quit using it, and I was keeping store too; but I cleaned it out and would not handle it.

E. M. REED.

Benton, Ill., April 14.

"STEPPING HEAVENWARD."

I have been trying for some time to quit the use of tobacco, but somehow I could not give it up till I read your article in GLEANINGS, April 1. It gave me strength, and I have not touched it since. I was in the habit of smoking. I am working in a store where people are smoking every day, but it bothers me but little, because I have made up my mind to quit. I hope you will continue to speak out on the subject.

Loachapoka, Ala.

T. W. COX.

THE NEW POTATO-PLANTER.

The potato-planter works to perfection. I used one last season with great satisfaction. There are no crooked rows by dropping the potatoes out of line—simply drop your potatoes in the planter, and put the machine where you want it, and it is dropped, covered, and planted in less time than it takes to tell it. They are indispensable to one planting only $\frac{1}{4}$ acre. They beat a hoe for corn where it is rough. For dry seasons they are a fine thing, as they put the seed down where the ground is moist, and they also save a hoeing.

Norwalk, Conn., April 14.

[I presume our friend means by the expression, "They also save a hoeing," that where each piece of potato is put right down into the moist ground it starts as quick as or quicker than the weeds, thus saving a growth of weeds before the potatoes come up. And I want to add that, if he will take one of the new weeders and go over the potatoes as soon as they are planted, and then do it again every three or four days, the potatoes will never need any hoeing at all. —A. I. R.]

R. J. CARY.

MOSQUITOES AND THE FAULTLESS SPRAYER; A NEW USE FOR THE IMPLEMENT.

Last summer I purchased a brass Faultless sprayer for general purposes. I live in a mosquito-infested country, and in spite of screens they will accumulate in the corners of the room. My wife often urged me to "fan them out," so one day I loaded the sprayer with coal-oil and went after them. I soon rid every room of them. At first my wife objected to the scent of the oil; but it soon dissipates. The mosquito is more looked upon than formerly as a public enemy, and the sprayer is a "great gun" to exterminate him (or her).

REG. ARCHILLION.

Archillion, Ark., April 8.

[I suppose our friend, in his closing sentence, alludes to the fact that scientific men now quite generally agree that the mosquito is quite an agent in carrying contagious diseases; and with this in view it is quite an important matter to drive them away, or, better still, kill them with coal oil. A government bulletin has already given notice that mosquitoes may be banished from a neighborhood by covering stagnant water with a thin film of coal oil, only a small quantity being needed for the purpose.—A. I. R.]

I have a copy of the A B C book. It is more than its publishers claimed for it.

Bowling Green, Ky.

E. J. SMITH.

THE CIGARETTE BUSINESS.

We clip the following from the *Practical Farmer*, Philadelphia:

The most radical anti-cigarette measure yet proposed is now under consideration in the Minnesota Legislature, having been introduced by Senator Halverson, one of whose constituents recently died from smoking too many cigarettes. The proposed bill is modeled on the Tennessee law, which the United States Supreme Court has held to be constitutional, and makes it a misdemeanor to use tobacco in this form, bars merchants from bringing cigarettes into the State, makes giving away cigarettes an equally grave offense, and even prohibits the sale of the papers used in rolling cigarettes.

CONVENTION NOTICE.

The spring meeting of the Eastern division of the Northern Illinois Bee-keepers' Association will be held at the residence of B. Kennedy, 7 miles southeast of Rockford, Ill., on rural route No. 5, and 3 miles northeast of New Milford, Ill., on Tuesday, May 21, 1901. All interested in bees are cordially invited to attend.

B. KENNEDY, Sec'y.

Maple Syrup.

None finer in quality than Medina County product, which took 1st premium at World's Fair. We put up syrup in quarts, two quarts, and 1-gallon square cans.

Best Medina Maple Syrup in Sealed Tin Cans.

One-quart cans, each,	\$ 30	24 for \$6 00
Two-quart " "	55	12 for 6 00
One-gallon " "	1 00	10 for 9 00

Syrup guaranteed strictly pure.

THE A. I. ROOT CO., Medina, O.



I WILL EXCHANGE SAW ARBOR

for Antique Furniture or old-time Flint Lock Firearms. Will also sell Saw Arbor for cash.

WM. S. AMMON, 216 Court St., Reading, Pa.

E. R. Root says: "One cage . . . showed a measurement of .18 and $\frac{1}{100}$; cage B showed a measurement of $\frac{1}{100}$ and cage D $\frac{1}{100}$. . . If tongue-reach means any thing, they ought to be good workers." They are three strains and are good workers. Queen circular free.

W. A. H. Gilstrap, Grayson, Cal.

A FEW LEFT---ORDER QUICK!

We have only a few of those slightly damaged bee-books left, so if you want one of them you will have to order very soon. It will be remembered that on January 1st there was a severe fire in our building, burning out entirely four floors above us. The water that was thrown on the fire came down through our floor damaging our stock of books, printing-office, etc. Some of the books were wet slightly, but enough so that they could hardly be sent out as perfect. These are the ones that we wish to offer. The reading pages of all are perfect, only the covers being a little soiled. Here they are, with prices postpaid:

Prof. Cook's "Bee-keeper's Guide," only 60c.
Doolittle's Scientific Queen-rearing, only 50c.
Newman's "Bees and Honey," only 40c.

They are all cloth bound, and latest editions. If you want a year's subscription to the old *Weekly American Bee Journal*, with any of the above books, add 75c to your order. This is a SPECIAL OFFER, and will last only so long as the slightly damaged books last. Better order AT ONCE if you want a bargain.

Remember we are

HEADQUARTERS FOR
Bee-keepers' Supplies in Chicago.

Catalog and sample copy of the
American Bee Journal free.
Ask for them. Address

George W. York & Co., Chicago, Illinois.

144-146 ERIE STREET.



THE FASHION FLOWER OF THE DAY

Is the beautiful sweet pea. Recognizing the popularity of this garden favorite, we offer for 1901 five new and handsome sorts, for 5 2-cent stamps, together with a copy of our new seed book, the most modern catalogue of modern times. It is so costly a production we cannot afford to gratuitously distribute it. (Postage alone is 5 cents.) We send it postpaid for 10 cents, together with one packet of each of these:

5 Grand New Sweet Peas.

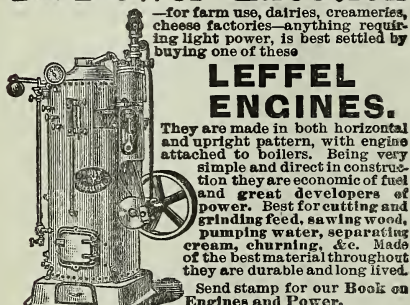
Navy Blue.	The best to date.	} Five separate packets.
Gorgeous.	Unique and distinct.	
America.	White striped carmine.	
Royal Rose.	A blushing beauty.	
Salopian.	Intense scarlet.	ONLY 10c.

With our new seed book free.

Features of our new catalogue for 1901 are 136 pages (9520 square inches of reading and illustrations) 7 handsome colored plates. A list of novelties in vegetable, farm and flower seeds to be had nowhere else this year, 35 new sorts now offered for the first time, and a complete list of standard seeds, bulbs, plants, fruits, etc., Other features, full cultural directions and many cash prizes. If you want an up-to-date garden and the best you ever had, you must plant Maule's Seeds. Send 10 cents for catalogue and these new sweet peas to-day. Address,

WM. HENRY MAULE,
1711 Filbert Street, Philadelphia.

The Power Question



—for farm use, dairies, creameries, cheese factories—anything requiring light power, is best settled by buying one of these

LEFFEL ENGINES.

They are made in both horizontal and upright pattern, with engine attached to boilers. Being very simple and direct in construction they are economic of fuel and great developers of power. Best for cutting and grinding feed, sawing wood, pumping water, separating cream, churning, &c. Made of the best material throughout they are durable and long lived.

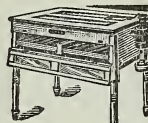
Send stamp for our Book on Engines and Power.

JAMES LEFFEL & CO., Box 89, Springfield, O.

250 Poultry Pictures



illustrating every phase of poultry raising and 224 pages of matter telling how, when and what. That and much more is in our "Profitable Poultry Keeping in all its branches." Tells also about the warranted for 10 years Cyphers Incubator, which is guaranteed to outlast any other incubator, or money refunded. Book for 10c in stamps. Circulars free. Address nearest office. Ask for book 74
CYPHERS INCUBATOR CO.,
Chicago, Ill. Wayland, N. Y. Boston, Mass.



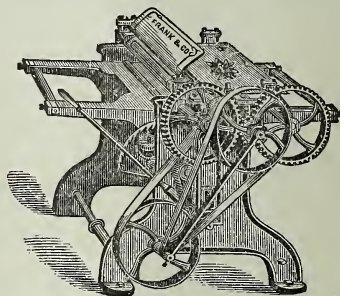
200-Egg Incubator for \$12.00

Perfect in construction and action. Hatches every fertile egg. Write for catalogue to-day.
GEO. H. STAHL, Quincy, Ill.



50 VARIETIES.

I breed fine poultry on one of the best equipped poultry farms in the world. Send 8c in stamps for new 1901 Book, telling all about 50 varieties, with special prices on fowls and eggs.
B. H. GREIDER, Florin, Pa.



PLANERS

The above cut shows one of our small Planers, of which we make twelve different styles and sizes. Also large Planers, Band Saws, Buzz Planers, Moulders, Wood Lathes, and all kinds of

WOOD WORKING MACHINERY

Send for Catalogue.

The FRANK MACHINERY CO.

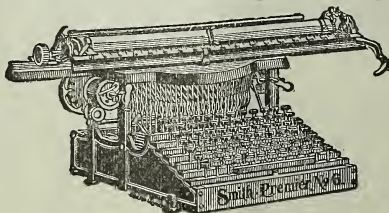
BUFFALO, N. Y.

New Smith Premiers Nos. 5 and 6.

The No. 6 takes paper 18½ inches wide and writes lines 16 inches long. The No. 5 takes paper 11 inches wide and writes lines 9½ inches long. These new machines in essential mechanical principles are the same as Models Nos. 2, 3 and 4—unequaled.

Write for Printed Matter Free.

The Smith Premier
Typewriter Co.



158 Prospect Street, Cleveland, Ohio.